

# The Journal

OF THE

## Michigan State Medical Society

ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

Vol. XIII

GRAND RAPIDS, MICHIGAN, MARCH, 1914

No. 3

### *Original Articles*

#### TRANSPOSITION OF THE UTERUS AND BLADDER IN THE TREATMENT OF EXTENSIVE CYSTOCELE AND UTERINE PROLAPSE.\*

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The word "transposition" is used in preference to "interposition" because it expresses more clearly than does "interposition" the essential features of the operation under consideration. "Interposition" suggests a change in the position of the uterus only. There is, however, a change in the position of both uterus and bladder, the altered position of the bladder being the more important feature.

Cystocele is hernia of the bladder through the vesico-vaginal septum and is generally the result of injury at childbirth with subinvolution. The protrusion of the bladder and the senile changes in the tissues which occur after the menopause gradually increase the size of the hernia. The hernial opening, in extensive cases of cystocele, extends sagittally from the pubes to the cervix and transversely across the entire anterior portion of the pelvis. The anterior vaginal wall is usually so much thinned by stretching and laceration that no definite borders of the hernial opening can be palpated. A urethrocele with thickening of the mucous membrane over the body of the urethra is often coexistent.

Uterine prolapse is hernia of the uterus. In prolapse of the uterus the broad and uterosacral ligaments are elongated, the vaginal canal dilated, the perineum relaxed and usually lacerated. The cervix and the body of the uterus are frequently enlarged from passive congestion, edema and hyperplasia. The cervix may be cystic and eroded as a result of laceration, infections and friction.

A cure of the cystocele necessitates firm closure of the hernial opening through which

the bladder protrudes. This is accomplished by interposition of the body of the uterus.

A chief factor in the cure of the uterine prolapse consists in twisting the broad ligaments, thus very much diminishing their length. This rotation places the fundus anteriorly near the pubes and tilts the cervix up into the hollow of the sacrum. When the large prolapsed uterus is forward beneath the bladder the congestion and edema soon disappear, atrophy takes place and the uterus is thus much decreased in weight. These are important factors in affording permanent relief.

The technic of the operation was illustrated by numerous stereopticon slides. The chief features were:

(a.) *Separation of the vaginal wall from the bladder.*

This can be done with entire safety by blunt dissection with the scissors if the points of the scissors are kept continually in contact with the anterior vaginal wall. The width of separation of the handles of the scissors is determined by the amount of resistance encountered and by the size of the cystocele. In starting the blunt dissection care should be taken to strike the plane of fascia, which is surprisingly distinct between the bladder and vaginal wall. Thus blood-vessels are not injured, dissection is facilitated, and wound secretion is minimized. Experience has induced me to make the amount of separation less than formerly, as a wide separation sometimes causes complications and is not essential to success.

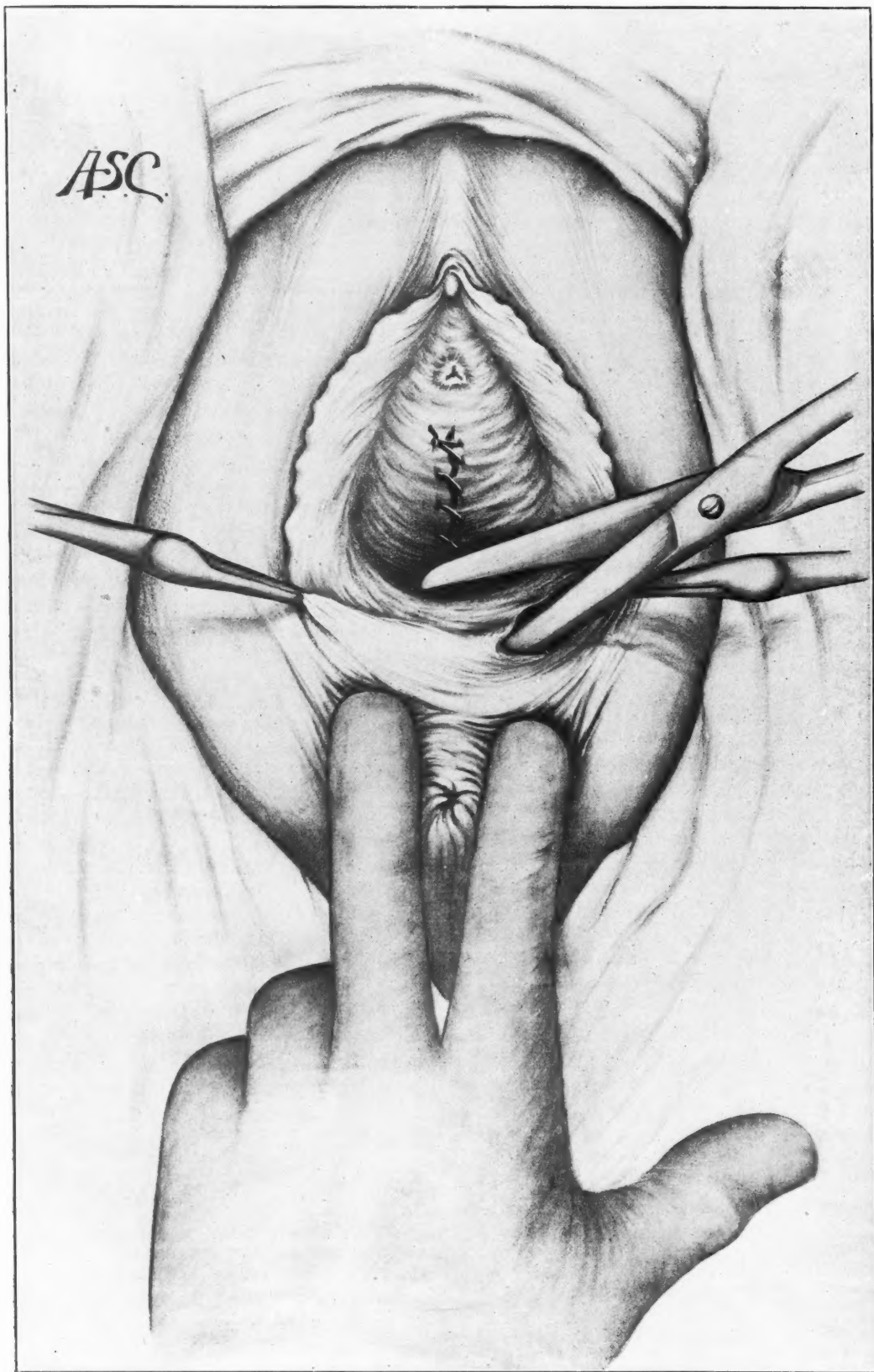
(b.) *Separation of the bladder from the uterus.*

This is also safely done with scissors. Care is used to find the plane of fascia between the bladder and cervix, which is as distinct as that between the bladder and vagina. In this dissection the points of the scissors are kept continually pressed against the cervix. Final separation is made with the finger when necessary.

(c.) *Incision of the peritoneum.*

A long narrow retractor is placed in such a manner that the bladder is displaced forward and the anterior uterine wall covered by peri-

\* Read before the Section on Gynecology and Obstetrics at the 48th Annual Meeting of the M. S. M. S. held in Flint Sept. 4-5, 1913.



PERINEORRHAPHY.

1. "A transverse incision is made along the muco-cutaneous line."

toneum is exposed. The peritoneum is now easily picked up with tissue forceps and incised.

(d.) *Delivery of the body of the uterus into the vaginal canal.*

This is done by successively grasping the anterior uterine wall until the fundus is obtained. By exerting traction upon the fundus the uterus is easily brought through the opening.

(e.) *The suture.*

One continuous chromicized catgut suture fastens the uterus to the vaginal wall and closes the vaginal incision. The fundus of the uterus should be sutured near enough to the urethra to make impossible a partial recurrence of the cystocele. Any noticeable hypertrophy of the vaginal mucous membrane over the body of the urethra should be excised before the suture is introduced. Otherwise it will protrude on standing and produce some distress. If a urethrocele is present the suture should be passed through the vaginal flap so that when tied it will draw the urethra up into its normal location. In cases of very large cystocele some of the redundant tissue is excised, but enough is left to insure broad surfaces for approximation. Continuing backward with the suture the wound made by the original transverse incision is at times closed sagittally to lengthen the vagina and displace the cervix further backward and upward.

Before the first tie is made in the suture the body of the uterus should be pushed back into the wound sufficiently to guard against strangulation, but not through the peritoneal opening.

If the cervix is much hypertrophied, lacerated or eroded, a portion of it should be amputated. This can often be accomplished quickly and satisfactorily by excision of the anterior lip of the cervix. It is occasionally necessary to make a high amputation of the cervix.

If the operation is done during the child-bearing period the patient should be made sterile by amputation of a portion of each Fallopian tube.<sup>1</sup>

If the uterus is very large part of it should be excised. This modification of the operation is described by the author in *Surgery, Gynecology and Obstetrics*, II, 654, 1906.

#### PERINEORRHAPHY

The operation is completed by thorough repair of the perineum.

#### TECHNIC.

A transverse incision is made along the mucocutaneous line. Any scar tissue is removed by denudation with scissors.

The edges of the vaginal tissue are caught

to either side of the median line with forceps. The dissection is now made with a Mayo dissecting scissors. By delicate manipulation of the scissors the plane of fascia is found which separates the vaginal and rectal walls. After this plane of fascia is exposed the two walls are very easily and safely separated as far as desired without producing any bleeding. The scissors dissection is easily extended into either sulcus. The flap should now be elevated and care should be used to see that the dissection extends sufficiently high on either side. The dissection should extend to the upper border of the levator ani. The vaginal flap is now incised along the median line its entire length so as to expose the levator ani muscle and fascia, to facilitate placing the sutures and to prepare for excision of superfluous tissue.

This illustration does not show as deep a wound as should obtain. The suture is also somewhat defective. All bleeding vessels should now be ligated, especially over the rectocele.

#### SUTURE.

The wound is preferably closed in two layers. The first suture approximates the levator ani muscle and fascia in the median line. The second suture unites the mucous membrane and skin and dips down into the muscle and fascia.

A good exposure of the pubic portions of the levator ani and fascia is the most important feature of the perineorrhaphy. This may be accomplished in one of two ways, viz.:

1. Under the guide of the finger this part of the muscle is grasped with a bullet forceps on either side, as described by Dorsett, and is brought into view by rotating the handle so as to displace the muscle toward the median line and outwards.

2. The blunt hook on the handle end of a Simon vaginal speculum is placed so that the skin edge of the wound in the median line is retracted rather firmly backwards. This puts the muscle and fascia on either side on tension and brings them into view so that they can be easily sutured.

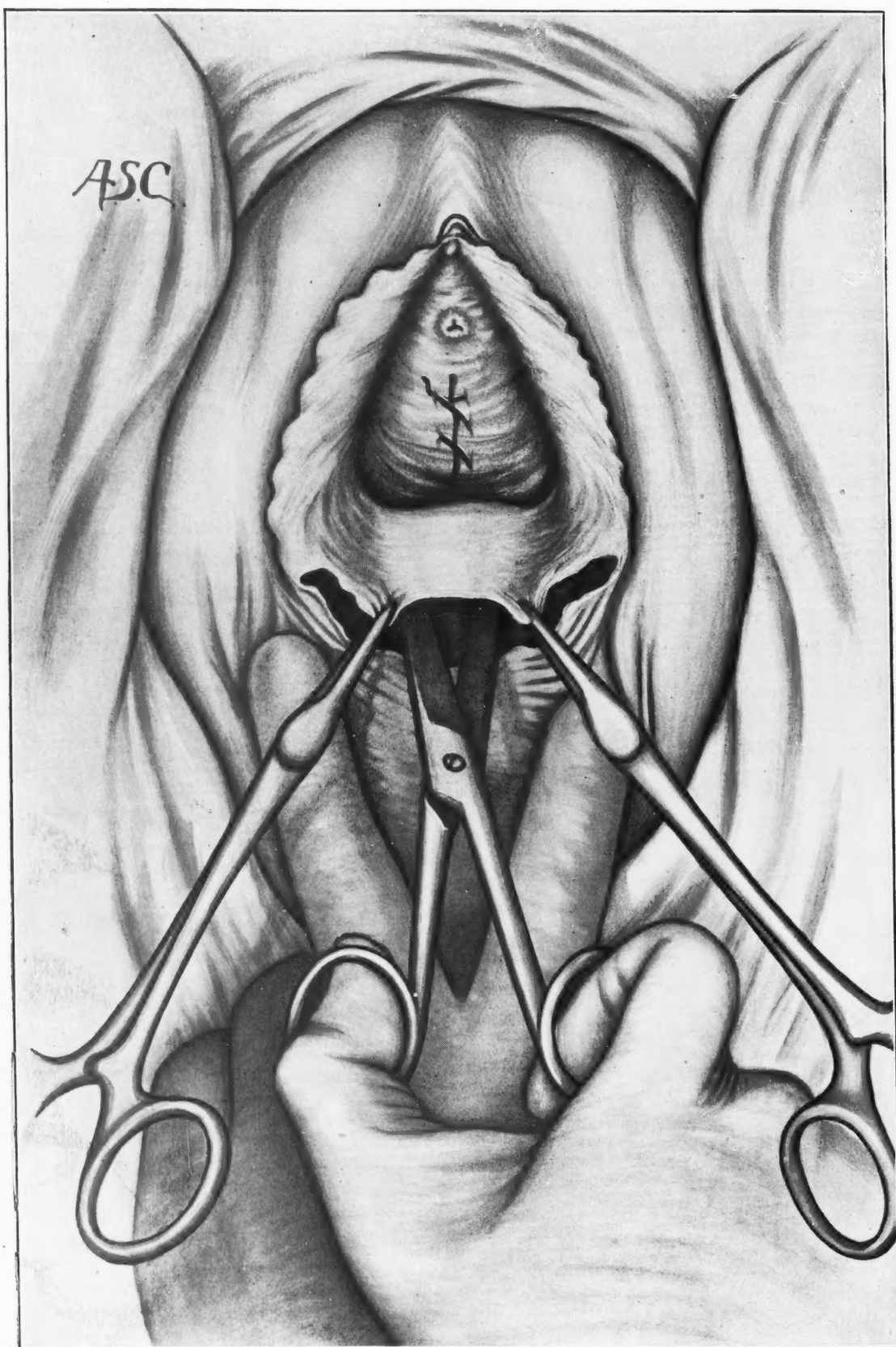
In cases of large rectocele the former method is preferable, in other cases the latter plan is advised.

The "first suture" is entirely buried. It should include deep bites of the muscle and fascia on either side. Injury to the rectum is avoided by placing the sutures well to the side and by displacing the rectum backwards with a blunt instrument or small gauze stick sponge while the first part of the suture is being placed.

The first suture should entirely displace backwards and upwards the rectocele and cover it as shown in Fig. 4; that is, the suture should close the hernial opening of the rectocele.

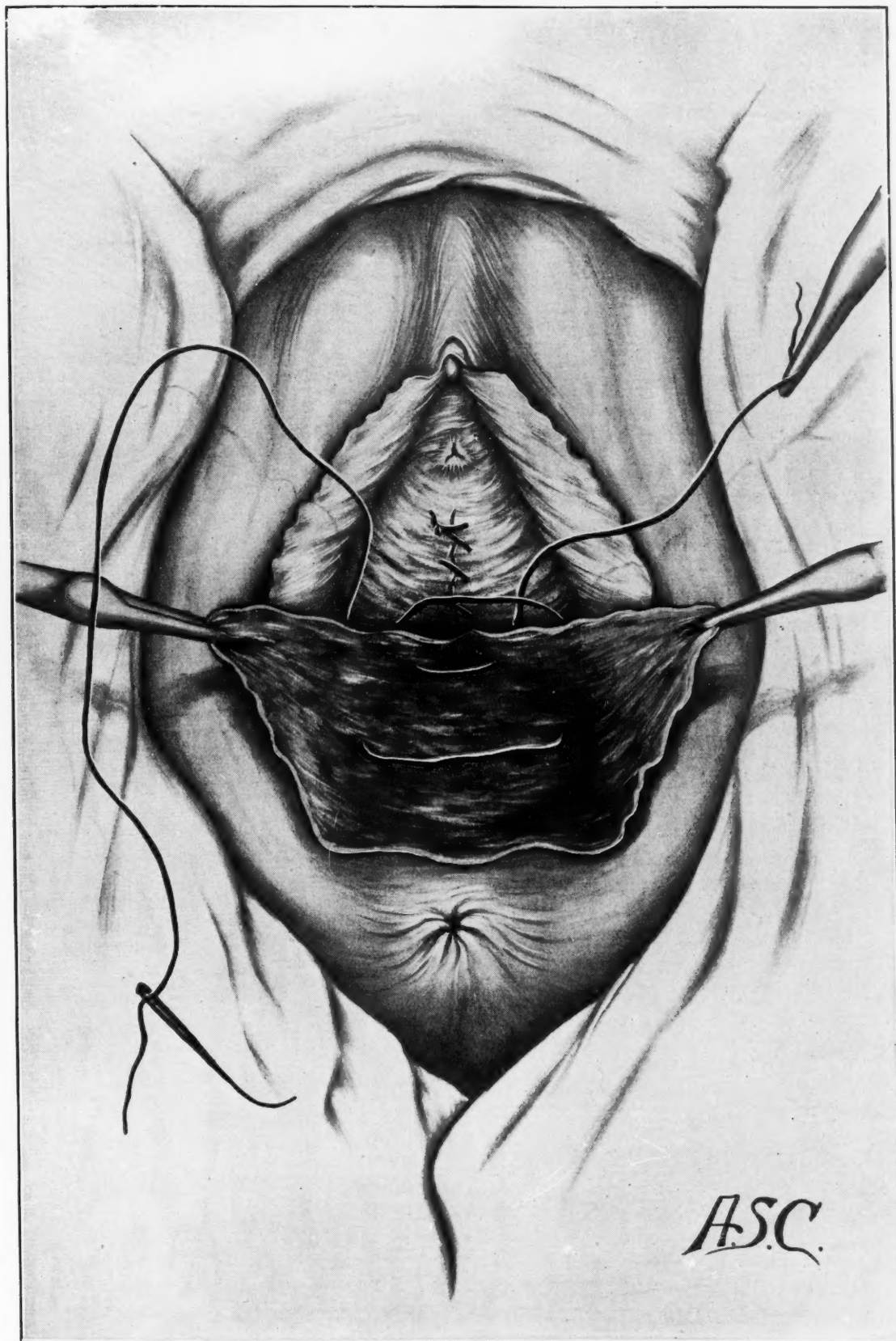
1. For illustrations of the prolapse operation see *Amer. Jour. of Obst.*, vol. LXV, No. 2, 1912.





2. "Care is used in inserting the scissors to keep the points pressed against the vaginal wall."





3. "The suture is inserted deeply into the levator and muscle and fascia on either side."

The suture in Fig. 5 shows how the loops of the "second suture" should be inserted obliquely so that the perineal body with each loop of the suture is drawn forward and inward to its normal location.

The tension upon the suture should be only enough for approximation of the surfaces. Much tension increases pain, strangles and cuts the tissues.

Fig. 6 shows the operation completed.

A surprisingly small amount of bulging of the anterior vaginal wall results. Conjoined palpation impresses one that the uterus is left but little more anteverted and flexed than is often the case in a normal individual. On cystoscopic examination the posterior wall of the bladder shows some convexity over the region of the interposed body of the uterus.

#### PERSONAL EXPERIENCE.

The author's experience with this operation dates from January 28, 1898. The number of cases operated is approximately two hundred fifty.

The cystocele has not to my knowledge recurred in a single instance. It is a mechanical impossibility for the cystocele to recur if the operation is properly performed. A cure of the cystocele is the important part of the operation because the extensive cases are usually found after the menopause, at which time the bladder is the only actively functioning organ involved in the operation.

A few of the patients (probably 5 to 10 per cent.) have had some recurrence of the uterine prolapse. In three patients the fundus of the uterus protruded after a considerable interval. These patients were cured by excision of the protruding part of the uterus and suture of the wound. In one case, a small senile uterus, the cervix and body protruded parallel to the vulva.

Drs. Mayo report a similar recurrence in their practice. One would expect a larger number of recurrences of the uterine prolapse as these patients often have a general abdominal ptosis and it is impossible to repair the hernia of the uterus with mechanical precision without obliteration of the vaginal canal. Some recurrence of the uterine prolapse is not particularly disturbing, because excision of the protruding part and suture of the wound is easily done and gives good results.

#### COMPLICATIONS.

A considerable percentage of the patients have had some vesical symptoms due either to a pre-existing cystitis or to catheter cystitis. In only one patient has this difficulty been persistent, due I believe to a previous chronic cystitis.

A few of the patients have had slight post-

operative elevation of temperature for a few days, due to retained wound secretion which became decomposed from contact with vaginal bacteria. This retained secretion always escapes spontaneously and normal temperature results.

A number of points learned by the writer as a result of difficulties encountered during operation and recurrences consequent to operation are deemed worthy of emphasis.

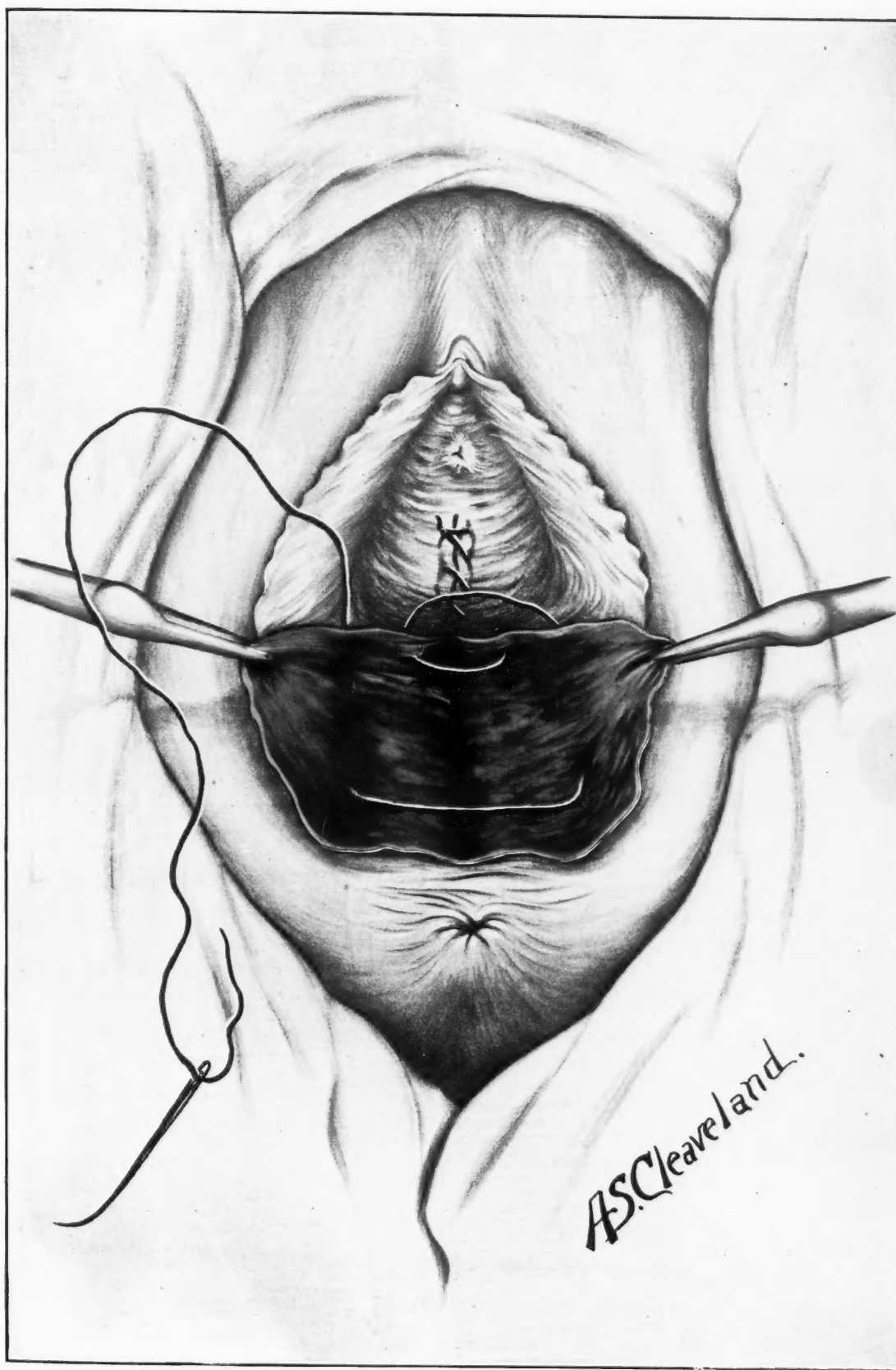
1. Blunt dissection with the scissors along easily found planes of fascia saves untold difficulties with hemorrhage. In earlier operations this dissection was needlessly extended far laterally between the bladder and uterus, with the result that the ureters were endangered and considerable unnecessary bleeding occurred. The wide separation also predisposes to retention of wound secretion and infection. We therefore do not agree with Stockel that widely extensive division of the tissues between the bladder and uterus is desirable.

2. After the bladder is separated the insertion of a narrow, long retractor between the bladder and uterus allows a clear view of the peritoneum over the fundus. This can then be incised without danger of injury to the bladder or intestine. Without the assistance of the retractor this step in the operation is frequently difficult and dangerous. Injury to the bladder with the scissors complicated two operations. In one of these a preceding inflammation made the injury unavoidable; in the other instance the technic was at fault. Closure of the torn bladder wall was easily accomplished by means of a purse string catgut suture. Uneventful recoveries followed.

3. If the uterus is very large, the broad ligaments very long, the cervix much hypertrophied or eroded, an excision of a wedge-shaped portion of the anterior wall of the uterus or a high amputation of the cervix is essential to a good result.

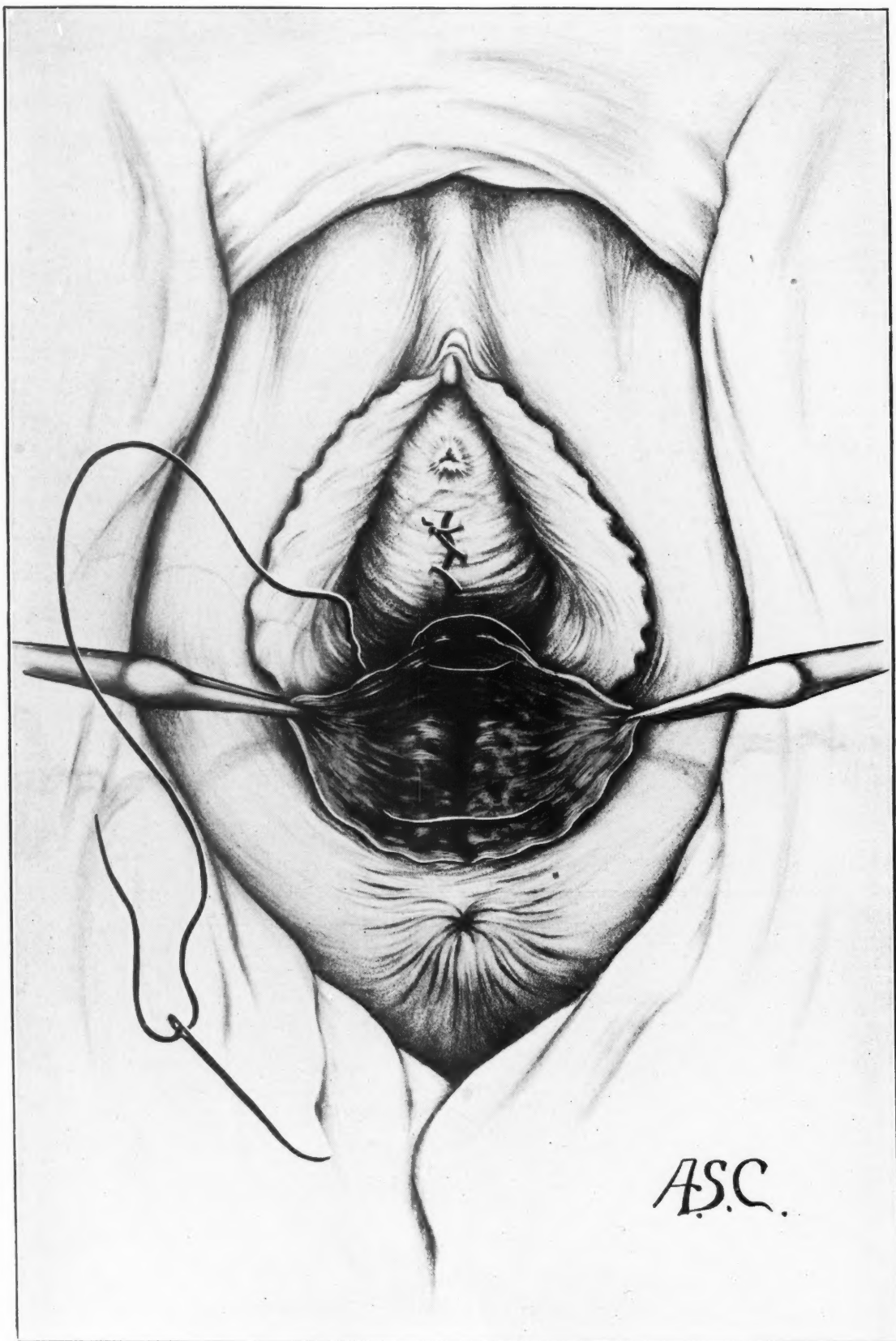
4. The occurrence of hemorrhage with accumulation of blood either between the uterus and bladder or between the uterus and anterior vaginal wall, as encountered by Lichtenstein, need rarely occur if separation is made along fascial planes as described by means of blunt dissection with the scissors. Should there be any bleeding, sutures placed deeply through the cervix on either side will include the vaginal branches of the uterine arteries and stop the hemorrhage.

5. Some elevation of temperature will occur in occasional cases as it is impossible to avoid some retention of wound secretion, contamination with vaginal bacteria and possibly colon bacilli. The use of a gauze drain, we believe, tends more to increase decomposition than to prevent retention of wound secretion. When fever occurs we have found that elevation of

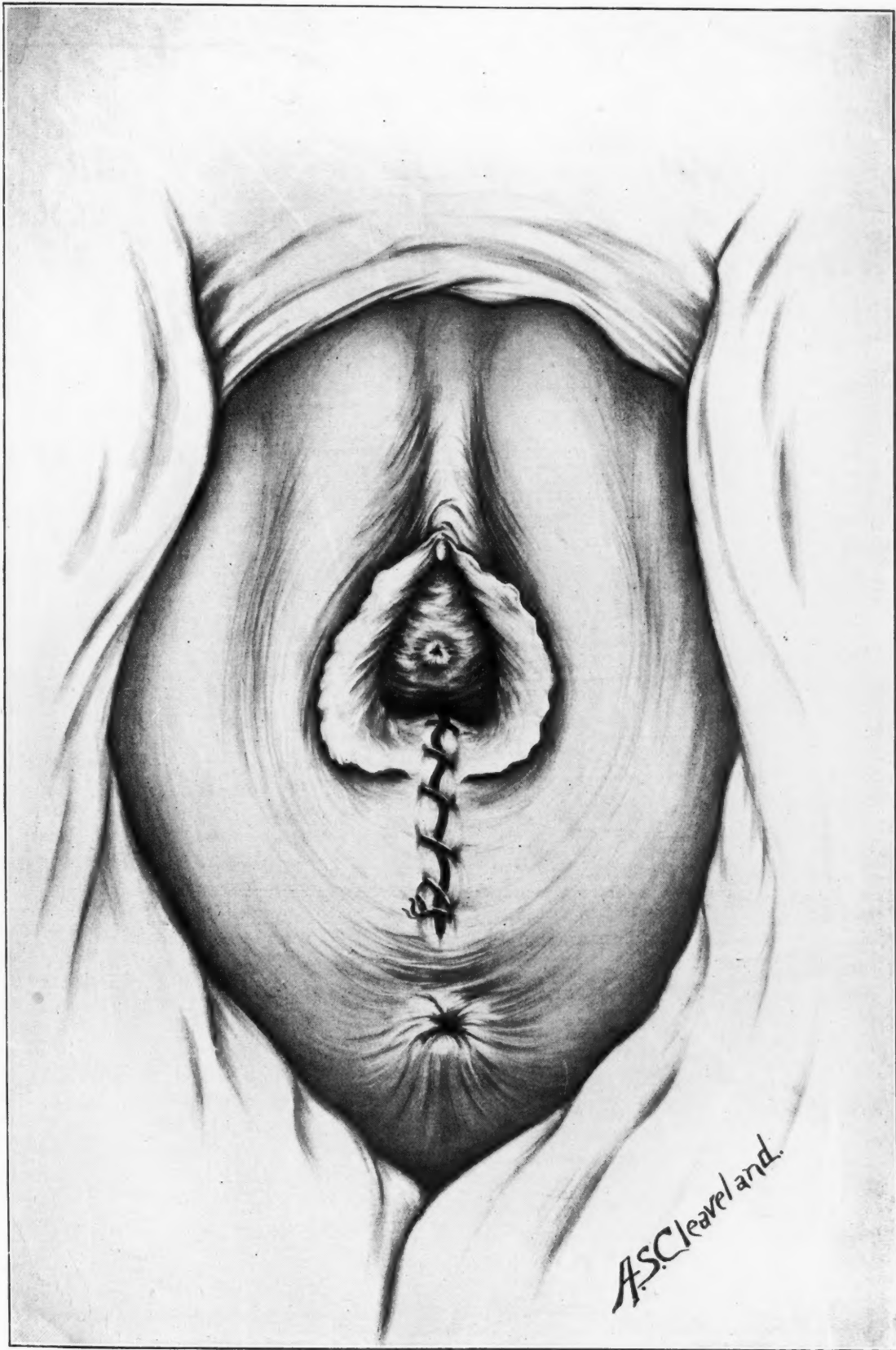


4. "The suture is passed deeply a number of times through the muscle and fascia."





5. "Broad surfaces of the muscle and fascia are brought together from either side between the vagina and the rectum."



6. "The entire wound is closed with one or two continuous chromicized catgut sutures."

the head of the bed and the use of moist dressings over the vulva is soon followed by drainage of an offensive secretion and consequent normal temperature.

6. When the bladder and uterus are transposed the forces which tend to produce a recurrence of a prolapse of the two organs oppose each other. Any tendency to recurrence of prolapse of the bladder tips the uterus further forward, twists the broad ligaments more, and thus elevates the uterus in the pelvis; any tendency to prolapse of the cervix elevates the body of the uterus and thus raises the bladder, which in its new position rests upon the posterior surface of the uterus.

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### HOW THE SMALL HOSPITAL MAY BEST SERVE THE COMMUNITY.\*

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I desire to express my appreciation of the invitation extended me to address you upon hospital matters. For it certainly is a privilege to have an opportunity of discussing a subject which has occupied a great portion of one's time for over twenty-five years. And I believe it shows the trend of the times that hospital affairs should be considered of enough importance to warrant a public meeting. And let me say here that only in an indefinite way am I familiar with the particular problems which confront this community and its hospital. While at first glance this may seem unfortunate, from another viewpoint it has its advantages, since my very lack of knowledge will tend to absolve me from intentionally criticizing your institution or its relations to your city. Therefore, I ask your indulgence, if what I am about to say implies a criticism. To point out faults where one is not thoroughly familiar with the facts in the case would be presumptuous and that is farthest from my intention. Moreover, since the entire hospital problem here and elsewhere is in a period of evolution, what appears to me wrong may turn out to be right and vice versa.

Things having to do with hospitals are so numerous and varied as to limit the discussion in the time at our disposal to certain phases of the subject. Since this evening we are particularly interested in a small hospital situated in rather a small city, numerically speaking, I have elected to discuss how the small hospital may best serve the community.

#### THE SMALL HOSPITAL.

Perhaps a word may be necessary as to what

constitutes a small hospital. When does a hospital cease to be small and become one of the larger hospitals? The definition of what is large and small in this connection must of necessity be somewhat arbitrary and always open to argument. Until hospitals have been standardized according to the amount or quality of the work they are doing, we must arrange hospitals into different groups according to the number of beds they have at their disposal for the care of the sick. And in estimating the size of different hospitals it is obviously necessary that comparisons be confined to the same kind of hospitals. For example, we have but the remotest interest this evening in hospitals for the insane, be they large or small. The same may be said of hospitals devoted to the care of tuberculosis, epilepsy, cancer, et cetera. Even when we arrange hospitals into groups according to the kind of work they are doing, it is rather difficult to decide upon the dividing line between a small and large hospital. While we at once agree that a hospital of twenty beds is small and one of three hundred is large we are not so certain in what category to place the hospital with one hundred twenty-five beds. For our purposes it is sufficient to say that a hospital with less than one hundred active beds may be considered small, while if the institution has one hundred beds or over it is either large or on its way to becoming large.

There is more than at first appears in this arranging of hospitals into groups according to size. While there are fundamental principles applicable to the management of all hospitals, great or small, in many respects the greatest efficiency is reached in hospitals of unequal size by an entirely different kind of management. Failure to realize this and the attempt to fasten upon the small hospital the intricate managerial machinery of the larger institution has led in more than one instance to confusion and disaster. And failure, when it involves the management of an enterprise not undertaken for gain, but to afford relief to the sick and suffering is to be regretted far beyond the ordinary business failure.

#### HOSPITALS OF TODAY.

In a general way every one knows that there are more hospitals in his community or state or the country over than there were, say ten or fifteen years ago. It is only when he studies the figures that he becomes amazed at the enormous development of hospital accommodations during the past forty of fifty years. In 1873 there were in this country approximately 149 hospitals with 35,453 beds. Today "there are in the United States 6,665 institutions on record for the care of the sick with a total capacity of more than 600,000 beds." It has

1. Modern Hospital.

\*Address delivered at Lansing, Michigan, January 8, 1914.



been estimated that these huge figures represent an investment in lands, buildings and equipment of not less than one and a half billion dollars and an annual outlay for maintenance approaching two hundred fifty millions. The rapid development of the country during this period with its accompanying increase of population explains to some extent the above figures. Changes in our standards of living, the tendency of the population towards cities and towns with its resulting overcrowding and congestion, the large influx of foreigners unable to withstand the stress and strain of an advanced civilization, all of these have tended to increase the ratio of dependants such as the insane and the feeble-minded who must be cared for in appropriate institutions. But other factors, much more powerful, are responsible for the great increase in hospital beds during the period referred to. During the past forty years there has been a complete change in the practice of medicine and surgery, particularly the latter. Forty years ago operations were performed only as a last resort and only submitted to under protest, so great was the resulting mortality and morbidity through septic infection. Once the idea was grasped that wound infection was due to something carried from the outside, there appeared the most elaborate apparatus for the sterilization of everything coming in contact with the wound. This apparatus was expensive and better handled in an institution than in a private home. The people were educated to the hospital idea until it was considered a matter of course that one should go to a hospital if an operation was to be performed.

Forty years ago only the poor and dependent were treated in hospitals. When once the advantages of hospital treatment were demonstrated people of moderate means and the rich demanded hospital accommodations. To supply this demand the older institutions built pavilions for private patients. When new hospitals were erected provisions were made for the care of pay patients, as well as for the very poor and so-called charity cases. Not long ago I visited a hospital in Chicago where the most elaborate accommodations had been provided for rich private patients. I forget the sum paid for one elaborate suite of rooms with a private bath—a hundred or hundred and fifty dollars a week—the exact amount is of no more importance to the patient probably than it is to our argument. The point I desire to emphasize is that people of moderate means and the well-to-do have insisted upon hospital accommodations when they found that their chances of recovery were better when treated in hospitals.

#### HOSPITALS OF ENGLAND.

It is interesting to note in passing that the same condition does not hold in England, as Osler has recently brought out in an address before the British Hospital Association. In that country with the exception of charity hospitals and those devoted to the care of the insane or patients suffering from the infectious diseases, hospitals are supported entirely by subscriptions and bequests of the charitably disposed. With very few exceptions the London and provincial hospitals do not admit into their wards, save in emergency, any but those who can not pay medical fees. This condition of affairs is so different from that in this country, where we have been wiser in our care for a not inconsiderable part of the sick of the country that I will quote a portion of Dr. Osler's address. He says: "If John Hodge has acute appendicitis he is taken to a beautiful hospital with all modern advantages. He is put into a big airy ward and spends his convalescence on a balcony surrounded by all the advantages the hospital administration can give. What happens to Lady Clare Vere de Vere? When she has acute appendicitis she is taken to a stuffy house, which has been transformed into a nursing home and operated upon in a back room, transformed into an operating theater. No wonder she hates doctors, nurses and the medical profession. Such experiences have alienated very largely the upper classes from the profession of science and medicine. Many nursing homes are admirable and up-to-date but many are not; in fact not one can take care of a patient as well as the general hospital."

Now all this has a distinct bearing upon the development of the small hospital throughout the country and has to do with our subject of how this same small hospital may best serve its own particular community. It must be borne in mind that the hospital, large or small, owned and maintained by the municipality is not under consideration at the present moment. We are speaking of the small hospital erected by means of private donations derived from one or many sources, and maintained by an endowment in whole or in part or from contributions from the citizens together with income derived from charges made to patients treated in the hospital. It is obvious that such a hospital will best serve the community by an adjustment of its machinery, whereby the very best treatment shall be furnished patients within its walls. Incidentally in many ways it may serve the community but only after the prime reason for its existence, the care of the sick, has been satisfied. It must provide accommodations for all classes of the community, the rich as well as the poor.

These accommodations need not necessarily be elaborate, but should be such as to insure comfort and well being, so necessary to the sick person in his or her struggle toward recovery.

#### THE FINANCIAL VIEWPOINT.

I trust I may be pardoned if I approach the problem before us from its monetary side. The question of money in connection with the alleviation of suffering is always more or less repugnant. How many, many times have I heard physicians speak of their profession enthusiastically but deplore the fact that they had to send bills or be bothered with patients' accounts. I remember the story of an old doctor in a small community beloved by everyone. He labored among his people early and late and was devotion itself. But he never would send a bill and never, if he could help it, paid one. A certain rich summer resident had called the doctor in to attend a member of his family in rather an acute illness. Having been informed of the old doctor's custom of never presenting a bill, he insisted that an exception be made in his case since he felt very grateful for the professional care his family had received. But the old doctor put him off from time to time and finally under compulsion said if the man must pay him something he could pay his office rent which was somewhat behind. The rich man thanked him, hunted up the landlord who received him with much rejoicing after he had told his tale and handed him a bill of twelve hundred dollars with the remark that according to his best recollection the doctor had once paid him twenty dollars on account. Now, a physician may be respected and admired for his many good qualities, but if he does not pay his bills he is somewhat of a failure. In the same way a hospital, small or great, to accomplish the most good must be run on business principles even if its mission be the care of the sick. If the hospital be adequately endowed its lot may be an easy one, since, like a professional man with an outside income, it can do more or less as it pleases, making up its deficit at the end of the year from the interest on its endowment fund. Yet in spite of its pecuniary advantages, such an institution often is financially embarrassed. The ease with which the money comes not infrequently makes for careless and extravagant management, or it becomes too ambitious and spreads out too much. More often it fails to give a good account of the money showered upon it in that it fails to care for the poor to the extent its endowment warrants. To fail in this respect is almost, if not fully as bad, as to fail in other ways.

But only exceptionally is the small hospital endowed. Usually it may be considered fortu-

nate if its buildings have been paid for. Its two sources of income are the moneys received from its patients and from private donations. The usual, but in my opinion the wrong way of administering the finances of the hospital is to treat all moneys received as income for meeting the expenses of the institution. The reason why this is a wrong method is at once apparent, if we imagine ourselves in the position of donors. A., for instance, is perfectly able and willing to give one hundred dollars annually toward the support of the hospital provided, and here is the point—provided this sum is used for meeting the hospital expenses of some poor and deserving person or persons. He is unwilling, however, to have a portion of his one hundred dollars used to reduce the hospital expenses of his friend B., who has occupied a room in the hospital and is well-to-do. It is perfectly possible to determine in a well managed hospital the per capita cost of caring for patients. Just as in a business enterprise, every expense of maintenance should be included in arriving at the estimate, not the mere cost of food, help, laundry and surgical supplies, but interest on the investment, taxes if there are any, as well as insurance. Then the private patients should have this sum apportioned amongst them according to their ability to pay. If it be found advisable to make the ward rate at or slightly under the per capita cost of maintenance, the charge for the use of the private rooms should be made higher. Only those who have had experience in the management of a hospital fully realize the attempts that are made by those amply able to pay to secure a reduction in hospital rates. Physicians are not altogether blameless in this regard. For in spite of the advantages accruing to them from a well equipped general hospital where they can treat their private patients, they are loath to see any increase in hospital rates. This opposition to an increase is perfectly justifiable if such increase be necessitated by careless or extravagant management. Otherwise it is far better for the physicians to stand off and allow the hospital to be a judge of its own financial affairs.

Charges for "city cases" are always a bone of contention between the city and the general hospital. The policy of most city governments where there is no municipal hospital is to drive hard bargains with a hospital for the treatment of its sick dependent poor. While the hospital management is desirous of caring for this class of patients, it can ill afford to secure a contract at a loss. If city patients be treated at a loss it is unfair to the pay patients who must make up the deficiency. Having had some experience with city officials and their methods of driving sharp bargains I know the arguments usually employed. If the hos-

pital is not willing to accept a certain sum for the care of city charges, the city will say that it will either make arrangements with another hospital or build a hospital of its own. The first threat can be easily handled by having an agreement between the two hospitals, if there be more than one, that under no circumstances will either care for city cases at a loss. In these days of trusts, gentlemen's agreements, et cetera, it may be I am guilty of advocating something illegal. If so I will take the risk. Morally, if not legally, there can be no harm in agreeing that you will not do business at a loss. The second, the building of a municipal hospital, need alarm no one. When the city becomes large enough so that it can save money by building and maintaining its own hospital, it will do so and not before. No city hospital can be built without the consent of the taxpayers and they will have to be shown before they will consent to the erection and equipment of a hospital building, the employment of a superintendent, matron and the rest of the help necessary to the running of a hospital, in order to save a dollar or two a week on the cost of caring for city patients in a privately owned or endowed hospital.

If the books of a hospital be properly kept it will not take long to convince intelligent people that the hospital is being economically managed and that the charges for patients are not excessive. Some sort of statement of this kind is absolutely necessary, when the hospital rates are raised, either because of the higher cost of living or for some other reason. This brings up the desirability of having endowed beds in the institution. Endowed beds are unquestionably of an advantage to a hospital in that it enables the institution to do more for the poor. But there is a business side even to this question. People who were able to endow hospital beds in perpetuity twenty-five years ago for five thousand dollars certainly got the best of the bargain. To agree to maintain a bed for two hundred fifty dollars a year, the interest on \$5,000 at 5 per cent., is to agree to make up the deficit from some other source. Fifty such donations in a fifty bed hospital would mean that the hospital management would have to beg to keep the institution going. I am afraid many institutions regret what was done twenty-five years ago in the way of endowed beds. Five thousand dollars looked big when the hospital was running behind, but that sum does not look so large now when the increased cost of living today is taken into account. Of course donations can not always be looked at in the light of mere dollars and cents. It may be that the effect of a gift may mean much to an institution even if the latter has to make good a deficit on an endowed bed. I simply wish to call attention

to the fact that an agreement for a certain sum of money to do a certain thing forever may mean hardship for those who succeed us.

Donations to the hospital, as I have intimated, should be used to care for the poor and needy unless they have been made for other specific purposes. If the hospital has been erected through the generosity of one or more donors, the hospital management is in duty bound to so manage the institution that at least the interest on such a gift be devoted to charity purposes. For donors do not have it in mind to give money in order that private pay patients alone may be cared for comfortably. This means higher hospital rates so that there will be a surplus for charitable work after all expenses have been paid. In the same way yearly donations should be considered as trust funds to be used for the care of the poor and indigent. If the man who donates one hundred dollars a year receives a report at the end of the year showing how his money has been expended, how one or more worthy sick persons have been helped with this money, he will be satisfied and feel inclined to equal or increase his subscription the next year. If, however, he feels that his donation has gone to pay the salaries of hospital employees, his enthusiasm slowly oozes away and with it his yearly hospital donation.

#### CONTAGIOUS DISEASE DEPARTMENTS.

Recent advances in the care of patients with contagious diseases have made it possible for the small hospital to be immensely helpful to the community. Contagious disease hospitals where patients with diseases, such as scarlet fever and diphtheria are cared for in separate buildings, are not only expensive to build but also to maintain. In Paris, in England and at Providence, Rhode Island, contagious disease patients have been cared for upon a different plan with very successful results. The idea underlying this plan of treatment is that the so-called contagious diseases spread through direct contact and are not air borne. By careful medical asepsis, by which is meant the sterilization of everything which comes in contact with a person having a contagious disease, it is possible to treat patients with the different diseases under one roof without danger of cross infection. For instance, the nurse in charge of a diphtheria patient is taught how she can care for such a patient and not carry the disease to another patient and how not to contract the disease herself. When she enters the patient's room she protects her dress from accidental contact by putting on a gown. If she gives the patient a drink of water the glass is immediately boiled, the gown is removed and she washes her hands thoroughly with soap and running water. If she treats a patient



with another kind of contagious disease, provided she has been conscientious in carrying out the rules of medical asepsis, she will not carry contagion from the first to the second patient. Time does not permit of the elaboration of this subject. Suffice it to say that this method of caring for patients with contagious diseases has been tried long enough to show that it is a success.

If patients with different contagious diseases can be treated under the same roof, it becomes perfectly possible for the small hospital to maintain such a department for the city, the latter of course paying for the initial cost of the building and equipment. Even if the city pay the regular hospital rates for the care of its patients in the contagious department, it will be a much cheaper proposition than maintaining its own hospital, provided the general hospital be economically managed. Moreover, the city as a whole would be the gainer, since the money and time lost through house quarantine would be saved.

Last August the city of Ann Arbor bonded itself for the sum of twenty-five thousand dollars to be given to the University for the erection of such a hospital. A twenty-four bed contagious pavilion is nearly completed and will soon be in operation along the lines set forth above. Such a department has long been needed in a University city where contagious disease is quite prevalent on account of the student population. The city of Ann Arbor wisely concluded not to go into the hospital business, preferring some one else to do the worrying.

#### HOSPITAL MANAGEMENT.

It goes without saying that to be a success a hospital, small or large, must be efficiently managed. It is not supposed that the board of trustees or the board of managers will give up a great deal of time to the details of management. In fact in most instances it is best they should not. Details can be and should be cared for by the hospital's executive officer, who has been elected on account of his or her expert knowledge of hospital matters. The managing board, collectively and individually, will have their spare time fully occupied in considering the general policy of the hospital, listening to reports from the executive officer and the chief of staff and deliberating upon whether their recommendations be adopted or turned down. I once heard a genius described as a man who had a faculty for getting other people to do his work. The board of managers of a hospital should be geniuses in the sense that they should have the wisdom to employ some one of experience to do their hospital work for them. Good executives are not easy to obtain but they can be found. They

are worth their weight in gold and should not be interfered with when it comes to details. Within reason it is not a question of salary, it is a question of securing an efficient manager—a cheap, inefficient hospital superintendent is a most expensive luxury. There may be a saving of twenty-five dollars a month on salary, but the loss through inefficiency will run up into the hundreds.

A good hospital superintendent with a love for his work will be full to running over with new ideas and schemes. All may not be expedient or wise, but if one out of three be valuable it will be a great gain for the institution. The managing board of a hospital would better look around for a new executive when the latter fails to bring forward new ideas concerning the policy or management of the hospital. Such a person may not be loafing on his job but he surely is not doing all he should.

#### THE CLINICAL STAFF.

One of the things I did hear about your hospital was that it had no clinical staff. If this be true I can only say that the hospital managing board does not fully appreciate the definition I have just given of genius. If I may be excused for a slang expression, the doctors are the easiest marks of all when it comes to getting them to work for you. They will take care of your sick poor for nothing. They will lecture to the nurses of the training school, incidentally treating the pupil nurses free of charge when they are ill. They will, if they are worked right, take long journeys at their own expense to study hospital methods suitable to the institution they are interested in. And all of this and more they will do if they are handled right and by that I mean if they be given some recognition. The time is too short to go into the arguments for and against a clinical staff in a small hospital. This much, however, I may say after an experience of over twenty-five years with all kinds of hospitals, large and small and after serving on the staffs of a good many hospitals—so far as the advantages are concerned, the real advantages of having access to a large amount of material from which he can learn and acquire experience, the man holding a staff position in a small hospital does not possess them. It is mostly an honorary position so far as the actual work is concerned. But the doctor, be he surgeon or internist, earnestly desires a staff position, so why not give it to him if thereby his co-operation and loyalty can be secured? I can assure you the advantages are all on the side of the hospital. The management of a hospital must look to the medical profession for advice upon certain questions. They do not themselves possess the special knowledge

and where else will they get it? It is certainly not difficult to realize that this advice will be more freely given if the person consulted be a member of the hospital organization and not merely a man who is bringing his patients to a specialized boarding house where he can treat them.

Frankly, I can not conceive of a hospital's wasting its opportunities by not appointing a clinical staff. It is vitally essential to the hospital to have the support of the best physicians of the city. While I am a firm believer in an open hospital, offering the privileges of the hospital to every reputable physician, I would certainly advocate the barring of all doctors with shady reputations and unfortunately there are always such men in all professions. The staff know such men where the hospital management may remain in ignorance of the true state of affairs. There is no particular incentive to a physician to warn the hospital authorities when his only interest in the hospital comes from the fact that he treats his patients there.

The size of the staff and the manner of its selection are mere matters of detail, easily worked out in each community. Each department of medicine should be fully represented. There should be frequent meetings of the staff where hospital matters can be discussed. There should be numerous committees, such as a committee on the training school, hospital diet, apparatus, et cetera. There should be a chief of staff, elected by the staff and confirmed by the board of managers. As executive officer of the staff one of his functions would be to meet with the board of managers as occasion may demand and voice the opinions of the staff regarding various hospital matters. The most successful small hospitals I have known have been those where there was the greatest co-operation between the board of managers and the staff of the hospital. The success of the institution was due to enthusiastic striving for a common object, the good of the hospital.

I believe in members of the staff of a small hospital being elected for short terms, say, for one or two years. If a member proves his unfitness for the position or is disloyal to the institution he fails of reappointment. The managers of a hospital need have no fear of losing patronage through the appointment of a staff. If a hospital offers a physician certain hospital accommodations he needs in his practice, he will avail himself of them whether he is a staff member or not. In fact he will redouble his efforts to be in favor with the hospital with the hope of securing a staff appointment.

#### THE HOSPITAL'S RESPONSIBILITY.

Perhaps one of the most serious difficulties confronting the small hospital is the regulation of the kind of work performed in it. It is not expected that there will be no deaths in the hospital. The most desperately ill patients are brought to the hospital, because they can receive better care there. If quite a proportion of such patients do not survive the public does not lay it up against the hospital. But this is not the case with patients who enter the hospital for elective operations and do not survive. To the friends the patient has seemed perfectly well. Then suddenly they learn he or she is dead and has died from an operation. If too many such deaths occur in an individual hospital the institution is criticized, perhaps unjustly, but still a prejudice develops against it. A hospital can not shirk the responsibility for what goes on within it. It can not say, "we are simply renting a room to this physician so that he can operate upon his patient." To the public the patient was in the hospital and died from the effects of the operation. Thus it behooves the hospital to know exactly what is going on. Not a few hospitals have been obliged to exclude certain men who were ambitious to do surgery, but lacked the necessary training and skill to do it successfully. There is some danger in a hospital making a contract for a certain class of surgical patients, unless it reserve the right to have some say as to the kind of person who shall do this surgery. I do not mean that a hospital should borrow trouble and be too apprehensive. I mean, aside from the fact that no institution or person for the sake of the patient, wants to see bad work being done, the reputation of a hospital and to a certain extent its success depends upon the kind of work done inside its walls. While it can control the work of its nurses and employees, and while it can control the work of its staff by seeing that no incompetent men are appointed, it is a much more difficult problem to control outsiders. Better far is it for the hospital to lose the patronage of a reckless and unskilled surgeon than to assume responsibility for what he does.

The clinical staff can be safely left to devise a plan by means of which the hospital shall be equipped with all the modern appliances, so necessary today in the diagnosis and treatment of disease. To endeavor in this day and age to administer to the sick without proper laboratory equipment is to attempt the impossible. The hospital should early recognize the desirability of being so equipped that the physicians of the city will be obliged to say to their patients that the only way such and such a disease can be investigated and treated is by

going to the hospital. This saves duplication of expensive apparatus in physicians' offices and above all redounds to the credit and reputation of the hospital.

#### THE TRAINING SCHOOL FOR NURSES.

Another way in which the hospital can be of great service to the community is through its training school for nurses. Even the smallest hospitals soon establish training schools, since the expense of employing graduate nurses is too great for both hospital and patients. No part of the hospital is more important than the training school, yet none is so apt to be neglected. Until state registration of nurses became a law hundreds of splendid young women were most shamefully misused. They gave their two or three years of service to the hospital without adequate return in the way of instruction. In some hospitals the training school curricula were deplorable, with the result that badly trained nurses were turned loose on an unsuspecting public. Now all this has been or will be changed by the State Board of Registration for Nurses. The pupil nurses must be well grounded in the principles of nursing, else they will fail to pass the Board's examination. A few failures from a given hospital and the news will quickly spread so that the hospital will receive few applications for admission to its training school. It will either be obliged to improve the quality and quantity of its instruction or else employ outside nurses which usually from a financial standpoint it is unable to do. Competition will also force the hospital, large or small, to give the pupil nurses a square deal in other ways than providing adequate instruction. The great increase in hospitals and training schools has made it much more difficult to secure pupil nurses than was the case fifteen years ago. To make the supply equal the demand the hospital must house and feed its nurses well. No longer is it a good policy for a hospital to overwork its pupil nurses to the point of exhaustion.

In working out the problems of the training school the advice and help of the clinical staff are indispensable. By their co-operation much unnecessary routine work can be abolished. We hear a great deal today of efficiency in various walks of life. We read in the magazines of how photographs of bricklayers and other workmen have demonstrated unnecessary movements, the doing away with which has made all the difference between profit and loss. Doctor Dickinson of Brooklyn is working on the same problem in connection with surgical operations. The same methods are bound to be employed with reference to pupil nurses. Take for instance the utility room or the linen room on a hospital floor. Each of

these rooms may have been so situated that the nurses are obliged to travel a number of unnecessary miles in the course of the day in order to care for their patients. This is a pure waste and should be remedied. One recording of temperature, pulse and respiration may not consume a great deal of time. To make the same records of twenty or fifty patients every two or four hours when this is unnecessary means a great waste of energy. The hospital staff physicians will co-operate and cut out useless things if their attention be drawn to the need.

If time permitted, I might speak at length upon another important function of the small hospital through which it may be of inestimable value to the city—social service work. We are learning that the work of the hospital is not completed when the poor patient is discharged improved or well. By returning to the same surroundings, the same condition which demanded hospital treatment may appear again. Co-operation between the hospital and the city along the lines of social service work is perfectly possible and is productive of a great deal of good.

In conclusion, let me say that I am fully aware that I have only skimmed the surface of my subject. In fact, what I have had to say has only been suggestive. If I have been instrumental in the slightest degree in stimulating any one to fill in the outline of my sketch I shall be more than satisfied.

#### ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS.

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During a trip abroad three years ago the writer first saw a number of cases of pulmonary tuberculosis treated in Vienna by the induction of artificial pneumothorax. Since that time many favorable results have been obtained and great confidence in the operation manifested by physicians in many parts of the world. The treatment has been adopted by the most important Sanatoria in England as well as on the continent and also by a considerable number of similar institutions in this country.

It has long been recognized that rest is one of the most important measures in the treatment of pulmonary tuberculosis and rest is unquestionably the most reliable means for reducing activity in the diseased lung as well as for producing a favorable influence upon the temperature, cough, expectoration, headache and general toxemia incident to the disease.

#### HISTORICAL DATA.

It is well known that the advent of spontaneous pneumothorax or a pleural effusion



often produces improvement in the condition of the lung and, vice versa, that the withdrawal of a pleural exudate in pulmonary tuberculosis is often distinctly harmful to the patient. Impressed by such observations, Car-

set of a pneumothorax. He also suggested the production of artificial pneumothorax in certain cases by puncturing the costal pleura in order to transmit atmospheric pressure to compress tuberculous cavities.



Fig. 1. A, the untreated lung. B, cavities in lung to be collapsed.

son of Edinburg in 1821 suggested the production of artificial pneumothorax for compressing tuberculous cavities and putting the lung at rest. In 1887, Adams published a report of a case of pulmonary hemorrhage in which the bleeding at once stopped on the on-

In 1882, Forlanini, of Pavia, reported a number of striking instances of improvement following the occurrence of spontaneous pneumothorax and suggested filling the pleural cavity with gas in order to compress the lung and prevent its expansion in suitable cases.

In 1894, he reported a case successfully treated by this method to the 11th International Medical Congress at Rome. In 1898, Murphy, of Chicago, unaware of Forlanini's work, conceived the idea of compressing the lung by filling the pleural cavity with nitrogen and published a report of five cases treated in this way. In 1889, his pupil Lemke published a report of fifty-three cases treated by this method, but owing to his unfortunate death the treatment was discontinued.

The reports of Forlanini attracted the attention of Brauer of Hamburg, who became thoroughly convinced of the value of the method and in 1896 Brauer published his first article upon induced pneumothorax.

Dr. Mary Lapham of Highlands, North Carolina, who has, perhaps, had a larger experience in this kind of work than any other physician in the United States, began her work in 1910. She took her first patient to Chicago where the initial injection of nitrogen into the pleural cavity was made on April 24th, by Dr. Murphy at Mercey Hospital. Since that time the literature on the subject in this country has been enriched by several contributions from Dr. Lapham as well as from Robinson and Floyd, Hamman and Sloan, King and Mills, Minor and other enthusiastic workers.

As stated by Otis:

"Not all cases of pulmonary tuberculosis, even if submitted to the open air treatment at an early stage, become arrested, but many steadily progress towards an advanced stage in spite of any and all treatment. Other cases first apply for treatment only when the disease is far advanced, so that there is always a large number of such unfortunate cases pathetically appealing to the physician for help, who knows all too well that he is powerless to render it. Occasionally, indeed, a far-advanced case does make an unexpected arrest, but generally it drags along, the disease slowly advancing, with now and then a stationary interval, until the patient finally succumbs; or else the disease continues progressively active and the patient makes a more rapid descent toward the final catastrophe. Such cases are the despair of the physician and the dupe of the charlatan into whose hand they often fall.

"To these previously considered hopeless advanced cases artificial pneumothorax offers another chance of arrest, and the increasing number of reported successful cases by men of the highest authority, and extending over a considerable period of years, has fully attested its value and established this treatment upon the firm basis of successful experience."

#### INDICATIONS.

Compression of the lung by means of an artificially produced pneumothorax has been usually attempted only in otherwise hopeless cases. It has been universally assumed that this should not be tried until all else failed and until recently the cases reported were practically all of a hopeless, desperate nature. Many cases recovered. Others succumbed; but in all cases failure was due, not to the use of

the method, but to inability to apply it properly because of complications. For example, if the lung is held by pleural adhesions it cannot be compressed. (Lapham).

King states that he has thus far limited the treatment to such cases as presented evidences of progressive disease in one lung and a comparatively slight lesion in the other and where the prognosis has been unfavorable. In the past year, however, a disposition has been shown to use the treatment in earlier cases and to employ it in any case that is not doing well with the usual dietetic and hygienic treatment.

Knopf has formulated the following indications for treatment by artificial pneumothorax: First, all such cases as have not improved under ordinary hygienic, dietetic, climatic and symptomatic treatment. Such cases are as a rule moderately or far advanced. Second, earlier cases in which there is no improvement because of mixed infection or lack of recuperating powers, or when for other often inexplicable reasons the condition remains stationary or the progress is particularly slow. Third, it is, of course, indicated in all rapidly progressing cases whether they are treated in institutions or at home, and no matter in what climate. Fourth, for all patients of the moderately or far advanced type, within or without institutions, who are discontented and feel that not enough is being done for them, and who are desirous of having pneumothorax tried. Last, but by no means least, artificial pneumothorax is indicated in uncontrollable hemorrhage or sanguineous expectoration.

Lapham has reported one series of cases in which the indications were inability to arrest the progress of the disease in fifteen cases, inability to hold a previous recovery in three cases, impatience to return to work and unwillingness to risk the uncertainty of symptomatic treatment in two active business men; while in another patient the operation was done on purely theoretical grounds.

Forlanini's indications are: I. Unilateral tuberculosis with slow or sub-acute course and with a pleura free from adhesions regardless of the degree of the lesion.

II. The same, with such adhesions as may be removed by artificial pneumothorax.

III. Bi-lateral phthisis not running an acute course and with lesions on both sides not far advanced.

Lillingston's indications are: I. Cases of extensive and acute disease of one lung coupled with slight or no disease of the other lung.

II. Certain cases failing to respond to ordinary treatment even with considerable disease of the other lung.

Forlanini long ago called attention to the

value of this treatment in haemoptysis and all observers agree to its efficiency in cases with a tendency to hemorrhage of the lungs.

Lillingston reports eighteen cases treated for periods ranging from six months to three

Lillingston believed that the treatment prolonged their lives. He has seen no fatal accident from the treatment.

"It is obvious that the chances of symptomatic relief and the probability of ultimate cure

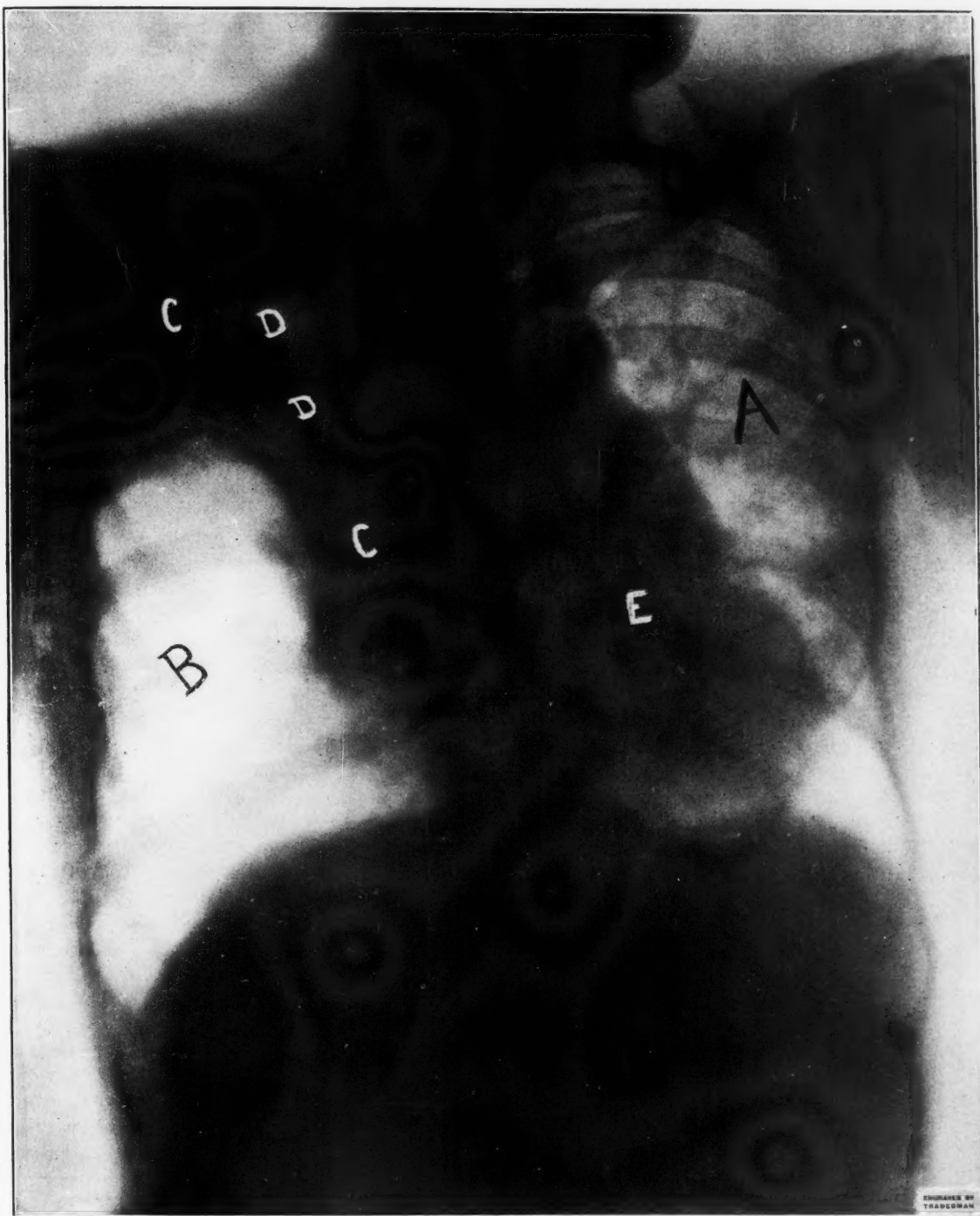


Fig. II. A, the untreated lung. B, gas in the pleural cavity. C, partially collapsed lung. D, collapsed cavities. E, heart displayed to left by pressure of gas.

and a half years. The disease was in the third stage and active and the prognosis was very bad in every case. Yet the disease was either arrested or undergoing arrest in thirteen. Five patients were either dead or dying, but

by pneumothorax therapy are dependent largely on one factor, namely, the extent to which existing adhesions may permit retraction and compression of the lung. The lung collapse will occur in proportion to the extent of the



pneumothorax; the degree of pneumothorax will correspond to available pleural space, which in turn is dependent on the extent and firmness of the adhesions.

"The most ideal conditions are those in which the adhesions, though perhaps extensive, are limited to the upper portion of the chest—in other words, those in which the disease is confined largely to the upper lobe. In such cases the introduced nitrogen not only follows the periphery, but occupies the space between the diaphragm and the lower lobe. If adhesions are not present between the latter surfaces a pneumothorax of considerable extent is established and the lung retracts to the adherent areas of the upper thorax. It is in this last group of cases that the greatest benefit may be expected." (Robinson and Floyd.)

#### CONTRA-INDICATIONS.

As decided contra indications, Knopf mentions the following:

First, extensive involvement of both lungs.

Second, when there is so much cavitation in the affected lung that there is danger of the needle entering a cavity.

Dry pleurisy or pleurisy with effusion.

Fourth, myocarditis, other serious cardiac complication, or serious renal complications.

Fifth, any pulmonary tuberculosis complicated by any constitutional disease which in itself is sufficient to inhibit all possible chances of recovery.

Sixth, when there is an ascites, or a distension of the abdominal cavity due to gases in the intestines, one must, of course, refrain from producing artificial pneumothorax until this condition is remedied, as otherwise a serious dyspnoeic condition and heart complications might ensue.

#### PATHOLOGY.

"It is to be regretted that we do not have a larger number of post-mortem records to show the exact nature of the pathological changes concurrent with this treatment. Graetz reports the autopsy findings in three cases from Brauer's clinic. He stated that tuberculous cavities showed a marked diminution in size as compared with those outlined in the clinical findings previous to the first treatment. The formation of connective tissue in the region of these cavities showed a tendency to cicatrization with contraction. Cicatrization of the isolated caseous areas was distinct, and the tendency to connective tissue formation around both the large and small tuberculous cavities was apparent, indicating that the infectious process had come to a point of quiescence, though complete healing did not yet exist. Both the old and the new cavities were characterized by exceptionally slight con-

tent of tubercle bacilli. There was a striking tendency to callus formation in the region of the vessels and bronchi, indicating the healing of perivascular and peribronchial inflammatory processes. Graetz concludes as follows: 'There is no doubt in my mind that the anatomical changes in the lung must be regarded as proof that the tuberculous disease has come to a standstill and is in the process of healing.' He associated this condition with the lung compression resulting from the artificial pneumothorax and believes that there is a certain relation between the extent of the connective tissue formation and the duration of the compression. This extensive cicatrization of the tuberculous process which was marked in the lung previously subjected to compression was not present in like degree on the untreated side.

"There are reasons for believing that changes in the lymph circulation are responsible for the clinical and pathological changes which occur after the establishment of a pneumothorax. This is demonstrated clinically by evidences of diminished toxic absorption, namely, a fall in temperature, a reduced number of night sweats, and a rise in the opsonic index. It would seem more consistent to ascribe this to a retarded lymph circulation than to an altered blood distribution. Pathologically it may be argued that atelectasis following pneumothorax, restricting the lymph circulation, limits the spread of bacteria and favors the growth of connective tissue. It would seem that lung compression might favor the escape of foreign infectious material into the lymph circulation; but the experiments of Graetz are evidence to the contrary, inasmuch as he has been unable to find artificially introduced material in the neighboring lymph nodes." (Robinson & Floyd.)

"When nitrogen is injected into the pleural cavity, and more and more pressure is obtained, the typical results are manifested in proportion to the degree of compression of the lung. At first the temperature may rise, the pulse quicken, and the amount of sputum increase on account of the pressure, but when these first effects are over, the lessened production and absorption of toxins is shown by a fall in temperature and pulse rate, and diminished expectoration. With complete compression of the lung, the breath sounds disappear or are heard only as a metallic whistling. There is drum-like resonance over the entire side except over the shrunken lung, which the X-Ray shows has little or no ability to expand. All this is but preliminary. The enemy has merely been driven out. The real reconstructive processes must complete the work so that recovery will be of the most durable and permanent nature, and no future re-

lapses can occur. While the lung is compressed it is safe, for no infection can occur. It is a more difficult task to put the lung in such condition that it will not always have to be compressed, but may with

blasts to shoot out from the walls into the injured tissues and for cicatrizing processes to convert the walls of ulcers and cavities into firm, durable scar tissue. Fortunately this organizing invasion of fibroblasts does not con-

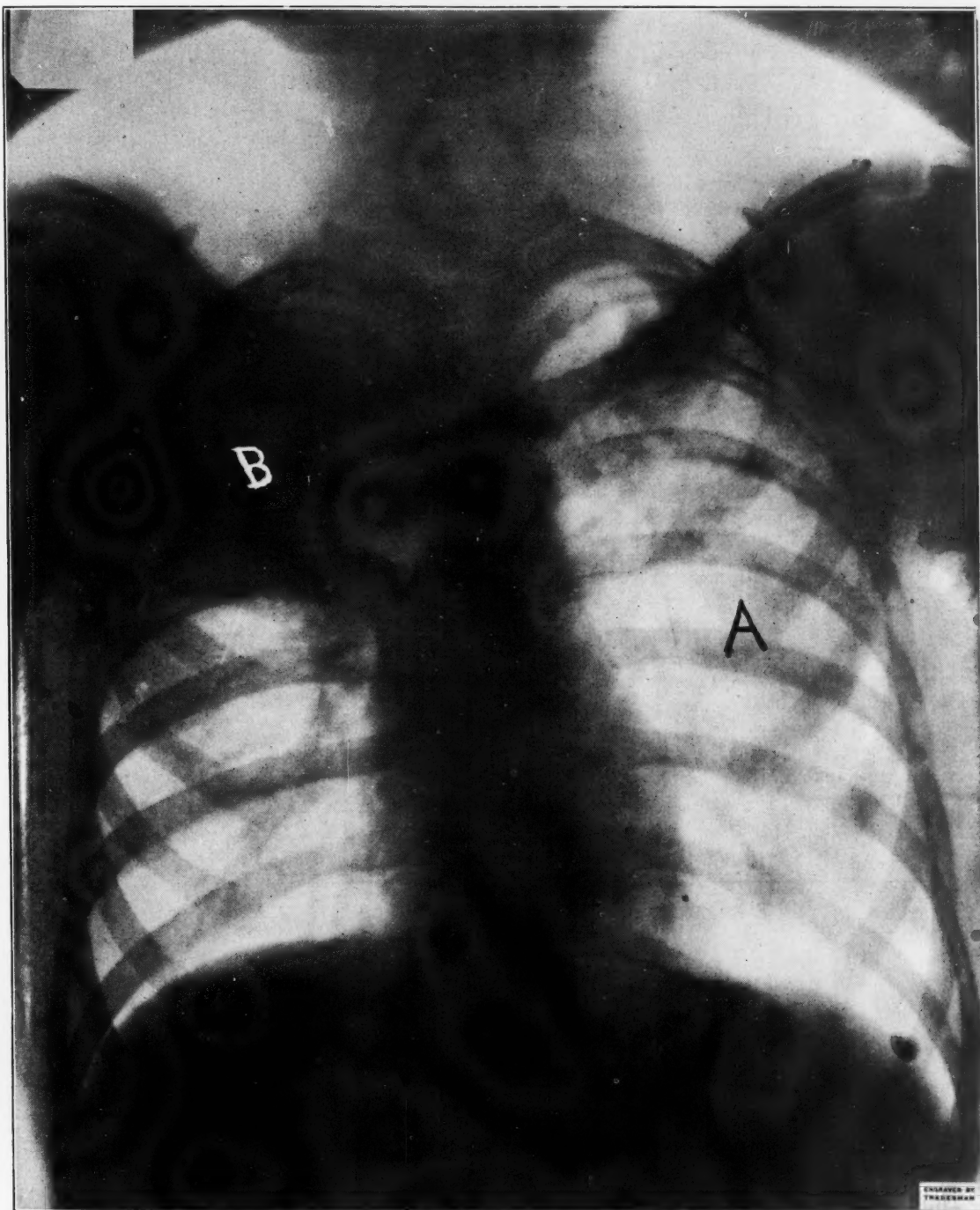


Fig. III. A, the untreated lung. B, consolidated upper lobe.

entire safety to the patient expand and resume its function. This is accomplished by maintaining sufficient pressure within the pleural cavity to hold the lung closely together so that the reparative processes may never be torn. Thus an opportunity is given for fibro-

cern itself with sound tissues. Elaborate experiments have proven conclusively that the sound portions of the lung are in no way affected by this process. Moreover, uninjured alveoli show no tendency to adhere no matter how long the pressure has been kept up. After

a year or more when the pressure is removed the healthy alveoli readily separate and resume their function.

"In order to insure complete anatomical recovery, it is generally agreed that the lung must be kept firmly compressed for about a year in uncomplicated cases before it is safe to allow it to expand. At first the nitrogen is injected frequently, then less often as the pleural surfaces lose their power of absorption. In the beginning the injections are made every other day, then twice a week, and later on once or twice a month will suffice."<sup>1</sup>

Like any other operative procedure, artificial pneumothorax has its dangers. Dunham and Rockhill mention the following:

First, heart misplacement and therefore derangement of blood supply, a strain of the aorta or a kink in the vessels resulting from too great pressure.

Second, break in the mediastinum, from too great pressure.

Third, gas embolism, which might result from a puncture of the lung and the needle entering an artery. The possibility of this can never be entirely done away with in using Forlanini's thoracentesis, but careful watching of the manometer and skillful manual technic will reduce the risk beyond the necessity of employing Brauer's thoracotomy in our opinion.

The fourth danger is that of infection of the pleural cavity and resulting pleural effusion and suggests a break in the asepsis. Effusion occurs in about one half of the generally reported cases.

The fifth, emphysema, is really more of an inconvenience than a danger.

The sixth danger, abnormal conditions, has been avoided by never giving an injection during the menstrual period or immediately following a debauch.

A considerable number of sudden deaths have been reported from this operation. The most frequent cause for this is gas embolism and the first patient I saw treated by this method in Vienna in the spring of 1911 nearly died from gas embolism on the table.

Other serious accidents are due to pleural reflexes such as slight collapse or dyspnoea, complete aphonia and spasm of the glottis. These accidents from gas embolism occur almost without warning. Cases of sudden death have occurred without any nitrogen having been turned on and come with instantaneous cessation of respiration and circulation. Quinke has reported several cases of sudden death which he has ascribed to gas embolism. Lenthart has reported six cases in which respiration ceased instantaneously. The patient be-

came pale and the pulse stopped. It was as if they were suddenly struck dead, as quick as lightning. In case death was delayed the symptoms were those of embolism such as convulsions, rolling of the eyeballs upward, contraction or dilatation of the pupils, loss of pupillary reflex, etc. With the improved apparatus in use at the present time and the careful regulation of the operation by the use of the manometer, no such unfortunate accidents should occur and in their conclusions Hamman and Sloan state that induced pneumothorax is a harmless procedure and the operation carefully performed is without danger. They also state that: I. A pneumothorax has, in most instances, an immediate and striking influence upon the cough and expectoration. Tubercle bacilli may disappear from the sputum.

II. Constitutional symptoms abate more slowly. In most instances there is at first a loss in weight followed by a gradual rise.

III. The total collapse of one lung causes surprisingly little inconvenience. Usually there is but slight dyspnoea on exertion. Many of the patients with an induced pneumothorax assist actively about the sanatorium.

IV. The procedure is of great value in the treatment of pulmonary hemorrhage.

V. While induced pneumothorax will never become a routine method for the treatment of pulmonary tuberculosis, in selected cases it offers a prospect of temporary relief when the usual methods of treatment have been unsuccessfully tried. Quiescent lesions in one lung and acute recrudescence in the other are the most favorable for the treatment. Its use need by no means be limited strictly to unilateral lesions, but when there is advanced disease of both lungs little benefit can be expected. It would seem advisable not to withhold treatment from a patient until he is hopelessly advanced, but to apply it judiciously to suitable moderately advanced patients in whom the disease tends to progress in spite of appropriate treatment.

Forlanini, in 1912, had performed ten thousand operations on 134 patients of whom two died from gas embolism, and twelve exhibited serious symptoms which were very alarming in five cases but never fatal.

Saugman, in 1913, with an experience of about 5,000 operations on 186 patients had seen two fatal cases at first injection.

Lillingston with an experience of thirty-two patients and several hundred punctures of the chest has met with no more alarming symptoms than slight shock of a minute duration in one case. In an article in the *London Lancet* of September 13, 1913, he mentions the following "don'ts:"

1. Don't inject gas without satisfactory

1. Lapham.



manometric oscillations or at a pressure exceeding the atmospheric pressure when beginning a first injection. 2. Don't spare anaesthetics. 3. Don't create a high intrapleural

during menstruation when reflex excitability may be raised. 5 Don't puncture on the first occasion in many different places in a search for a free pleural space; patients have collapsed

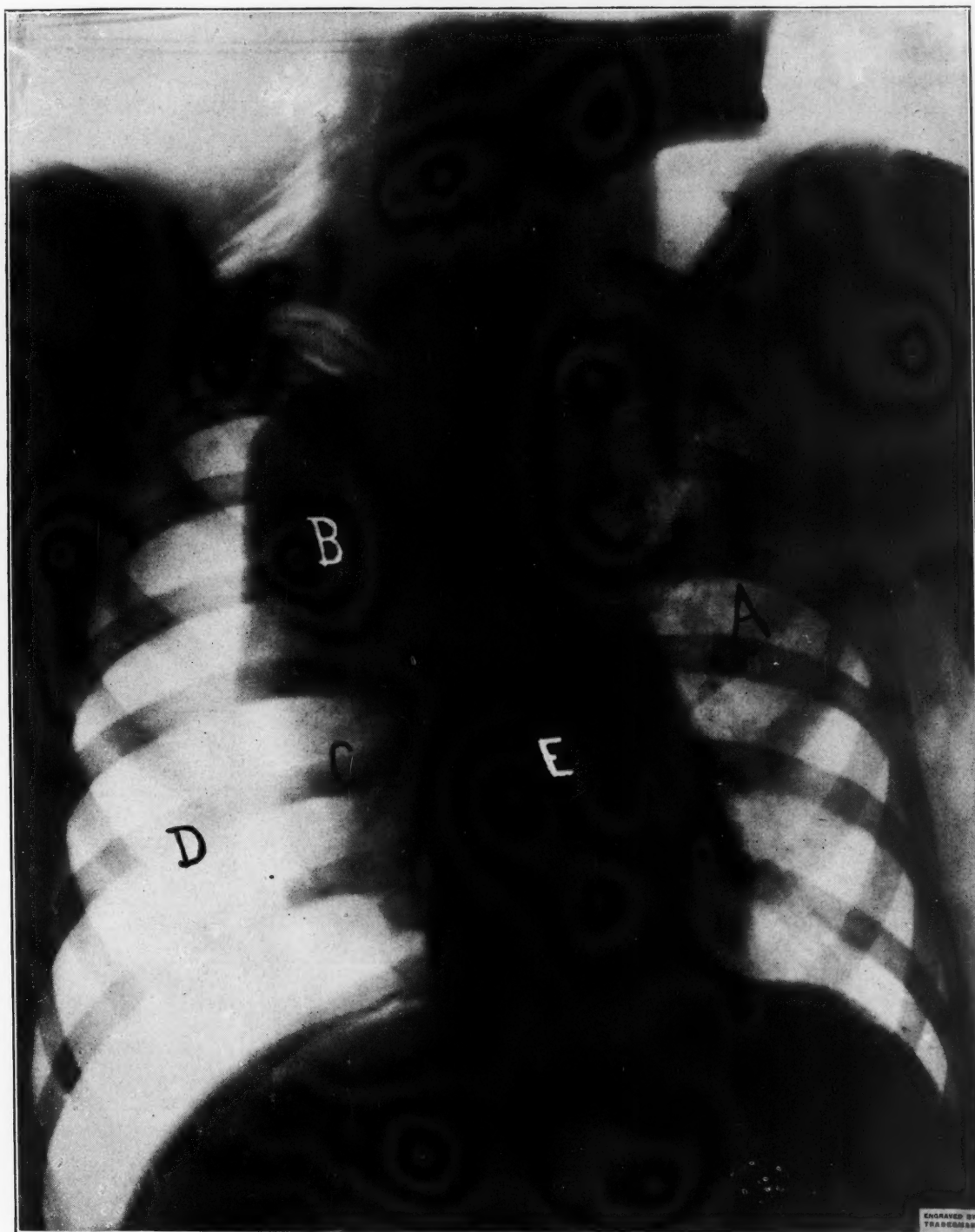


Fig. IV. A, the untreated lung, B, consolidated upper lobe collapsed, C, collapsed lower lobe. D, gas in pleural cavity. E, heart and mediastinum displaced to the left.

pressure. A pressure of forty cm. of water may cause no discomfort during an injection, but it may be more than doubled by a fit of coughing and a leak may spring in the pneumothorax. 4. Don't induce a pneumothorax

after the sixth or seventh puncture who have tolerated the first punctures well. It is better to continue the search for a free pleurae in a day or two. 6. Don't inject gas rapidly at a low temperature. Brauer has once seen

symptoms of pleural-reflex after the use of cold gas. 7. Don't use large needles or needles with rough surfaces; and don't let the rubber drag on the needle during an injection. 8. Don't inject until the patient's posture is easy and comfortable. 9. Don't hesitate to withdraw the needle at the earliest sign of collapse. 10. Don't operate without brandy and a hypodermic syringe of ether handy.

H. Braham of Hanover, Germany, in a communication presented to the Congress in Rome, reported eighty cases in which there was no hope from any other method of treatment, 49 of which or 61.2% being apparently cured by means of artificial pneumothorax.

Rothschild believes that it is well worth while to try an artificial pneumothorax in all one sided cases of tuberculosis in which there is no improvement under the ordinary treatment in which the inflation is possible; that is, where the adhesions are not so extensive that they prevent inflation and compression. If the patient shows signs of improvement under the treatment with artificial pneumothorax, keep it up; if not do not reinflate. The same principle should be followed in regard to the other side—in case this should be slightly affected. If it should improve through the increased aeration, which the compression of the other side necessitates, keep up the artificial pneumothorax on the bad side; if it should get worse, interrupt the treatment.

Sorgo has applied therapeutic pneumothorax in forty-five cases of tuberculosis and is convinced that *it is the most effectual operative procedure known to date* and that its application is justified in all cases of severe unilateral phthisis. The great trouble he found was, as have all other operators, that patients at first constantly lost weight under the artificial pneumothorax, and this in turn had an unfavorable action on the other lung. The main point consequently of this compression treatment, he states, is to ascertain that the other lung is sound or at least that the process in it is mild, restricted to the apex and displaying a benign tendency. The outcome seems to depend entirely upon this lung.

Renon states that in spite of the objections that have been raised to this method of treatment such as the danger of whipping up a process in the other lung or bringing on heart trouble, the tediousness of the treatment and its expense, we must recognize the record of great benefits realized. This is particularly striking, he declares in the cases of acute tuberculosis which have proven rebellious to all other measures. In cases of galloping pulmonary tuberculosis in which the process continued a progressive course in spite of all treatment, and a fatal outcome in four or five weeks seemed certain, he has witnessed the immediate

arrest of the progressive course under the artificial pneumothorax. Even if there are a few pleural adhesions preventing the complete collapse of the lung, the partial collapse answers the purpose and it may become total as the adhesions stretch and break. It is possible, he adds, that these acute forms with rapid softening of lung tissue and tendency to severe haemoptysis may prove to be the special indication for artificial pneumothorax while we are waiting for the specific remedy that will cure tuberculosis.

Jacquero states that in a series of twenty-three cases which he attempted to treat by artificial pneumothorax, pleural adhesions made the operation impossible in eight. These have since died, while a number of those successfully treated are practically cured and all were improved. A tendency to recurring severe haemoptysis was immediately arrested by the pneumothorax in two cases although the compression was not complete in one.

Van den Bergh states that the great danger in the procedure is that some minute focus on the other side may be whipped up by it, and the tuberculous lesion may spread rapidly. This occurred in one of the cases reported. To date it seems impossible to tell beforehand which patients will derive great benefits from the compression of the tuberculous lung by this means. For the present, therefore, it seems necessary to restrict the application of the method to cases of serious pulmonary disease limited almost entirely to one lung and progressing under conservative measures.

Spengler has recently reported his results in the treatment of ninety-three cases with therapeutic pneumothorax. Twenty-six per cent were clinically cured; 41% had not quite completed the course, but the improvement to date was very encouraging. In only 21% was the desired result not realized and in most of these cases conditions prevented a complete pneumothorax. Thus favorable results were realized in 69 of 93 cases or in over 78%.

Gray of Chicago is of the opinion that artificial pneumothorax offers much in selected cases and that no progressive case should be given up without first considering this operation. He thinks it is better to sacrifice a partially destroyed lung than to await its almost certain destruction because it is possible to save a fair percentage of otherwise hopeless cases.

Robinson and Floyd have reported twenty-eight cases of phthisis which have been subjected by them to artificial pneumothorax and state that: I. Pleural eclampsia or a reflex inhibition of the heart through vagus irritation from the pleura is a danger to be considered in this treatment as in other therapy

requiring thoracentesis. We believe that it may always be prevented by anaesthetizing the pleura with novocaine before puncturing it.

II. Air embolism may result from the direct introduction of gas into a pulmonary vein.

IV. Pulmonary tuberculosis when essentially unilateral, and resistant to hygienic treatment, is in a certain number of cases arrested by the continuous employment of artificial pneumothorax therapy. Our treatment has



Fig. V. A, the normal lung. B, thickened pleura with bronchiectatic cavities in the lung.

This should never occur if the technic is faithfully observed.

III. We have experienced no accidents and believe that they are always avoidable, and so conclude that pneumothorax therapy is a safe procedure.

been of insufficient duration to permit us to claim a permanent cure in any one case. We believe, however, that it is possible as proved by the recent reports of Brauer and Spengler.

V. We conclude, therefore, that artificial pneumothorax is entitled to definite recogni-



tion in the treatment of pulmonary tuberculosis.

Before undertaking the introduction of an artificial pneumothorax in a given case, a careful physical examination of the chest should be made and the X-Ray should be used in every case.

Dunham and Rockhill of Cincinnati have emphasized the importance of roentgenograms, to watch the progress of the disease, to detect the extent of the lung collapse, to note the pressure on the heart and mediastinum, to exclude pleural effusion and to safeguard the unfilled side. Unfortunately, the X-rays are not of direct value in helping to decide whether or not it will be possible to find a free pleural cavity. They have learned from stereoscopic roentgenogram that it is almost impossible to make out accurately the extent of the pneumothorax by percussion because in some cases the lung is collapsed anteroposteriorly and in others the lung is adherent to the chest wall as a streamer, a collapse taking place around the various attachments, whereas complete collapse from chest wall to mediastinum is rather the exception. It is of great interest in many of these cases to watch the cavities gradually become obliterated by successive injections of gas. The position of the heart cannot always be made out by percussion and auscultation either, as it is frequently pushed from the left posteriorly, rather than altogether from the left to the right. In short, these conditions can only be determined by the Roentgen rays; but perhaps the greatest value of roentgenography lies in being able to watch the progress of disease in the uncollapsed lung.

Dunham and Rockhill are of the opinion that eventually artificial pneumothorax will be utilized for much earlier lesions and that the collapse will be obtained by more radical surgery when the pleural cavity is obliterated by adhesions.

#### AUTHOR'S EXPERIENCE

My personal experience with this operation in the treatment of pulmonary tuberculosis is perhaps too limited to render my opinion of much value to anyone but myself, but no one I am sure can watch the progress of cases treated in this way without becoming an enthusiastic advocate of its use in certain cases, and my observation has convinced me that the operation can be done to great advantage in much earlier cases than its originators suggested.

No greater advance has been made in recent years in the treatment of tuberculosis and when employed in addition to the recognized methods of treatment, the results at times seem truly wonderful. One has but to try the method to become convinced of its usefulness. As

Knopf states, it cannot of course be considered a cure-all, but it will often help when all other methods fail.

By no method of examination is it possible to tell positively whether or not any given case is suitable for treatment. "To determine in the presence of tuberculous disease of the lungs and pleura a point at which the pleural layers are not adherent is a task attended with great uncertainty. The percussion note is the most reliable guide. That area presenting the note nearest approaching the normal resonance is most likely to be free from adhesions because of the apparent absence of either a thickened pleura or underlying tuberculous consolidation. A stethoscope may also aid in determining whether the lung is mobile or fixed within a certain area. Auscultatory signs indicating the absence or limited existence of underlying tuberculous disease may aid in designating an area of non-adherent pleura." (Robinson and Floyd).

Only repeated attempts will enable one to tell whether the pleural cavity may be entered and a pneumothorax successfully produced. One of my patients, after an illness of three years, spent two months in a Chicago Sanatorium where she went for the purpose of artificial pneumothorax treatment. No attempts were made to enter the pleural cavity and at the end of that time she was told that owing to repeated attacks of pleurisy, the number and density of adhesions were such as to render her case unsuitable for this method of treatment. I was able to enter the pleural cavity and introduce 775 cubic centimeters of gas on the first attempt. After eight treatments, extending over a period of six weeks, a pneumothorax containing 1,500 cubic centimeters of gas was produced. The lower lobe of the lung as seen in Figure 2 was completely collapsed; the lower portion of the upper lobe was contracted upwards but not inwards, owing to adhesions; the daily amount of sputum was reduced from five to two ounces; the maximum daily temperature brought down from 101 or 102 to normal; the pulse from 110 and 120 to eighty or ninety; and the patient put on the road to recovery.

Another case (Figure 3) also showed the impossibility of telling from physical signs and X-Ray pictures whether or not the pleural surfaces were adherent. It also showed the great usefulness of artificial pneumothorax in acute pneumonic phthisis or galloping consumption—a class of patient which almost invariably do badly. B. S., aged twenty years had been ill but six weeks when I first saw him, during which time he had lost twenty pounds in weight. His maximum daily temperature was one hundred one to three, pulse constantly rapid, expectoration five to six ounces per day.

The physical signs showed consolidation of the upper lobe of the right lung with areas of cavitation. Coarse and medium rales were heard throughout the left chest. The X-Ray picture (Figure 3) confirmed these findings

introduced and to my astonishment the X-Ray picture (Figure 4) showed almost complete collapse of the entire lung with no evidences whatever of adhesions. It also showed that the consolidation was confined to the up-

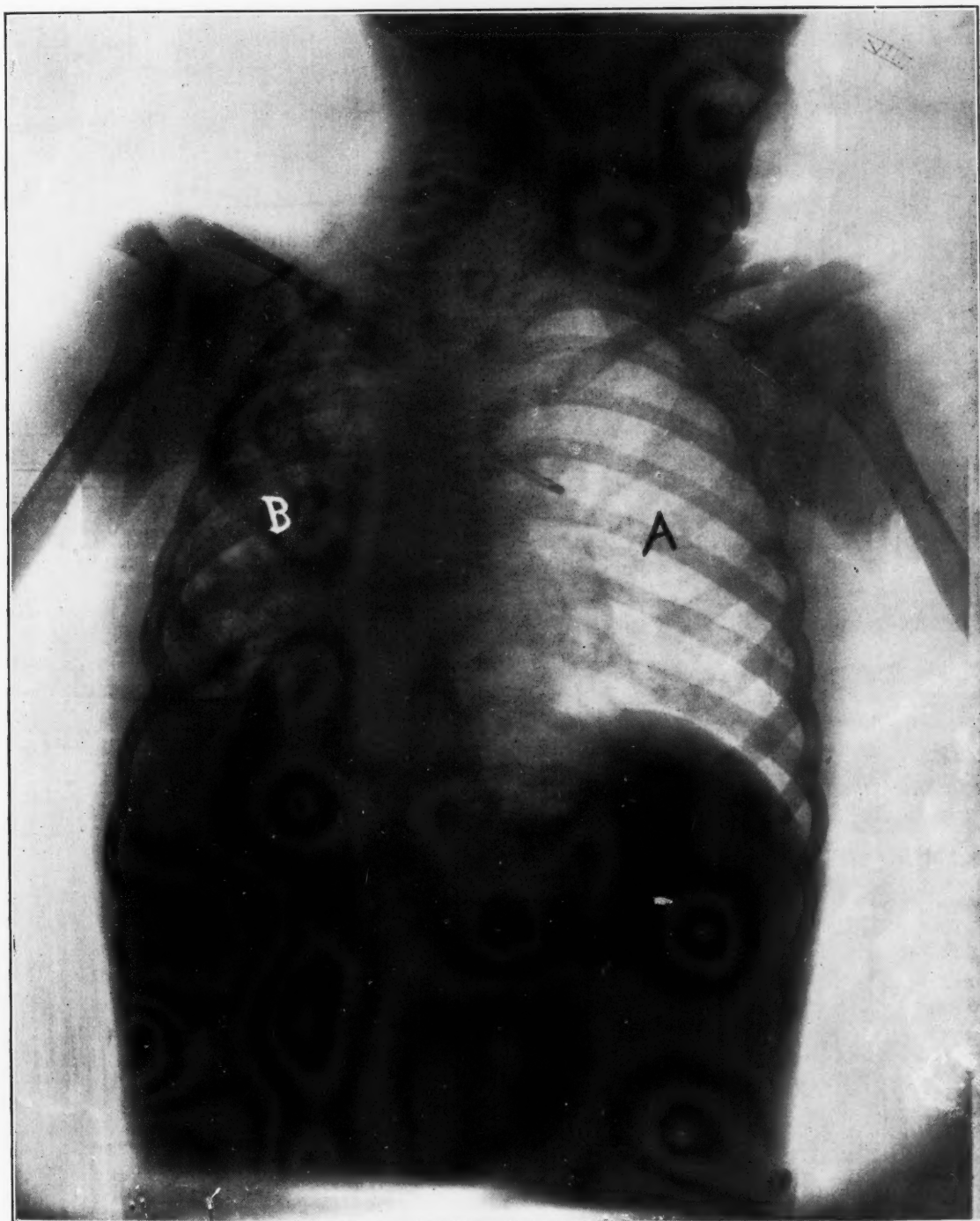


Fig. VI. A, the untreated lung. B, the diseased lung after the introduction of 1100 cubic centimeters of gas into the pleural cavity which is traversed by numerous bands of adhesions.

and warranted the belief that complete collapse of the lung would probably be prevented by adhesions. To my great surprise 1,200 cubic centimeters of gas were readily introduced at the first attempt. Five days later 1,400 cc, were

per lobe. The different degrees of collapse in the upper and lower lobes are distinctly shown in the picture.

Physical examination showed the respiratory movements to be more marked on the left

than on the right side: but little dyspnoea; precussion note hyper-resonant over the right front and back; tympanitic along base. Tactile fremitus absent everywhere: Breath sounds not heard: Whispering voice accompanied by metallic overtones over the whole side: No rales. Left Side—Tactile fremitus felt over both front and back; Breath sounds harsh over the whole side: Few rales. At the end of one month's treatment, during which time he received five fillings, his temperature was constantly normal, the pulse from 75 to 90, the sputum reduced from six or seven to two ounces per day, the appetite was good and the patient had begun to gain in weight.

That one must not become discouraged at being unable to enter the pleural cavity at first is shown by my experience in the case of a little girl seven years of age with disease in the left side of the chest. Eight months previously she was taken ill with broncho-pneumonia which ran a protracted course and terminated in what was supposed to be empyema. Her physicians administered an anaesthetic and punctured the chest wall in nine places—three in front, three at the side and three in the back—in an attempt to find pus. None, however, was found, and after an irregular fever with considerable expectoration, accompanied by loss in weight, she was brought to Grand Rapids. Physical examinations showed considerable dullness in the lower part of the chest behind and diminished breath and voice sounds, with impaired resonance and many musical resonant rales over the front of the chest. The dullness in the back was not of quite the character and extent found over an effusion. It seemed, however, to be more dense than would be produced by a thickened pleura and from the history of the case I was inclined to believe the child had an empyema. Through a small aspirating needle I drew out a syringe full of pus. The following day under anaesthesia at the hospital I repeated the exploration, withdrawing another syringe full of pus, and then resected an inch of rib. To my surprise on going through the pleura but a small amount of pus was obtained. I inserted a drainage tube and had an X-Ray picture (Figure 5) taken the next day. It showed a greatly thickened pleura in the lower half of the lungs rendering it impossible to determine definitely the condition of the underlying lung, and bronchiectatic cavities in the upper half. The tube was taken out at the end of a week and the child returned to its home. During the next two months her condition remained about stationary. The temperature would be normal for a few days and then for a week or ten days would rise each day to one hundred one to three degrees. The child was then brought back to the Hospital and a stereoentgenogram

taken which showed about the same condition as when the first picture was taken.

Pielsteicher and Vogt report ten cases of artificial pneumothorax ranging in age from ten months to fourteen years. In eight of the cases the conditions favored the successful collapse of the lung by this means and confirmed again the great benefit derived from shutting off an entire lung even in the youngest children. The results were disappointing in the cases of chronic bronchiectasia. Radiography showed that adhesions prevented the collapse of the lung at certain points. In cases of tuberculosis the outcome was wonderful, the disease taking an unhoping turn for the better. In two such cases the condition had been regarded as absolutely hopeless before. One was in the youngest child treated and in this case there was a slight effusion into the gas filled cavity. The first operations were made under general anaesthesia.

The experience of several operators, especially abroad, has been that in applying the procedure to children with chronic bronchiectasia it is sometimes hard to tell when the needle is in the pleural cavity. I found this to be true in this case. On my first attempt I punctured the thoracic wall in four places, but was unable to satisfy myself that I had entered the pleural cavity. Several times the manometer gave slight excursions, but knowing that this might be the case if the end of the needle was in the lung substance, or a pulmonary cavity, or in a mass of pleural adhesions, I preferred not to take any chances and so desisted from my attempts to introduce gas. On the second attempt three days later 1,000 cubic centimeters of gas were introduced with a single puncture. Three days after 1,100 cc. of gas were introduced. This was a large amount of gas to inject at the second treatment, especially in so small a patient, but the gas flowed freely under slight pressure and without any apparent unpleasant effect upon the patient. From the amount of gas introduced and the marked excursions of the manometer, I knew I was in the pleural cavity. Such pronounced movements of the manometer can be produced in no other way. The X-Ray picture (Figure 6) does not show a well-defined pneumothorax as in the other cases illustrated. The gas seems to have diffused itself throughout a large number of meshy pleural adhesions or perhaps masses of disorganized lung tissue, some of which seems to be in the shape of strings running from the surface of the lung to the chest wall. Perhaps also the lung is collapsed in an anteroposterior direction rather than laterally. From the amount of gas injected, and the apparent collapse of at least a portion of the lung as is indicated by the physical examination, as well as from the re-



duction in the amount of sputum from nine to three ounces per day, I am hopeful of eventually relieving the little patient. Physical examination over the right lung shows areas of hyperresonance at the side and back, with di-

The benefits obtained in such cases is shown by my experience with Mrs. C. whom I have had under observation since March 1913. She has had chronic pulmonary tuberculosis for seven years and during that time has had the usual

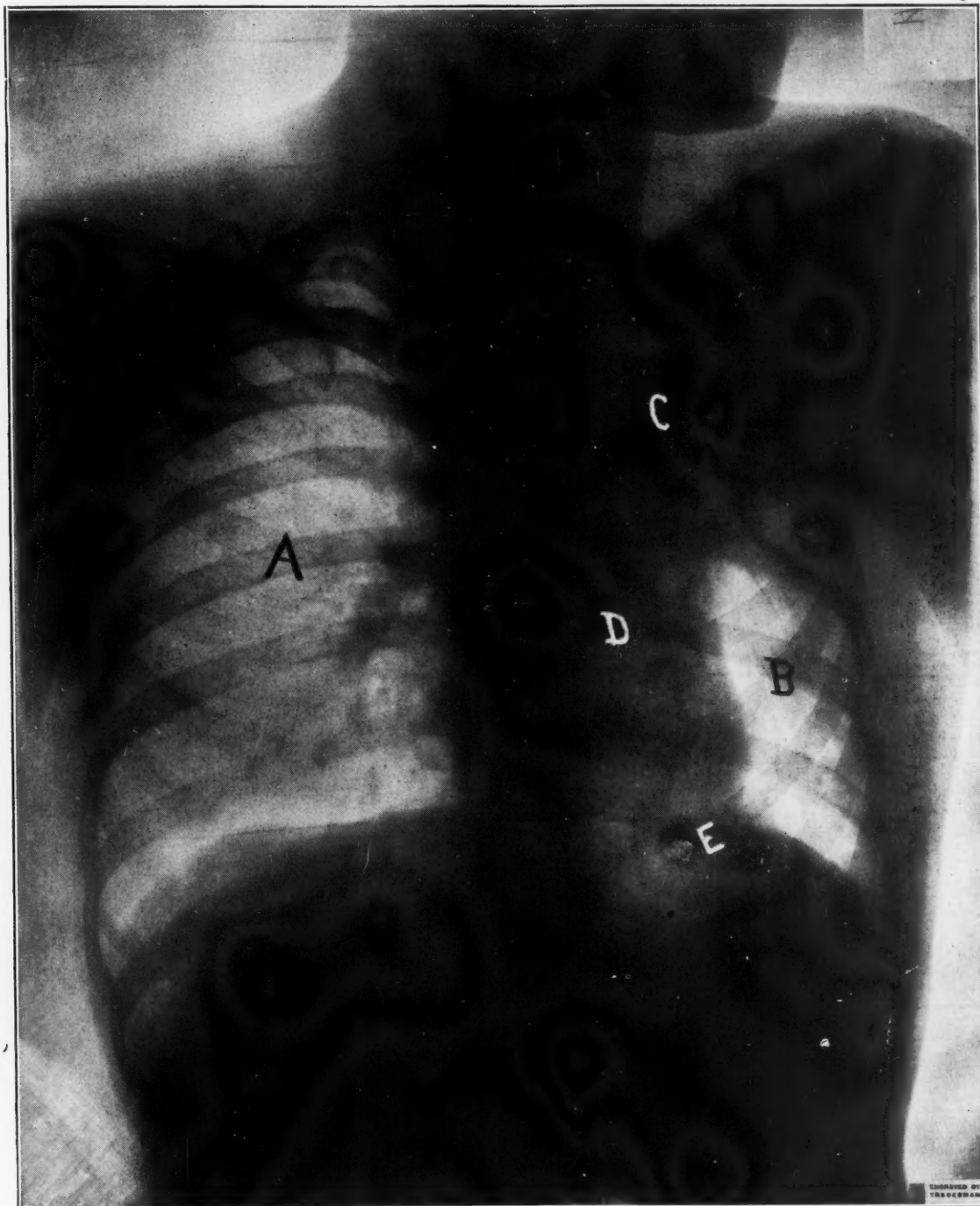


Fig. VII. A, untreated lung. B, the diseased lung. C, consolidated upper lobe with several cavities. D, the heart drawn to the left by the contracted lung. E, adhesion between pericardium and the diaphragm.

minished tactile fremitus, absence of breath sounds, and whispering voice of a metallic quality.

All observers agree that artificial pneumothorax is of great value in cases with hemorrhage of chronic sanguineous expectoration.

exacerbations and remissions peculiar to such patients. Last July she had two severe hemorrhages and has raised more or less blood since that time. During the summer she expectorated from one to two ounces per day and lost several pounds in weight. At one time she

was in bed for ten days with a temperature of 101 to 103.

Physical examination showed an advanced lesion involving the entire left lung with a less advanced one on the right. The upper left

many resonant rales. Kroenig's isthmus was contracted from seven to two and a half or three centimeters.

Owing to the advanced fibrosis and contraction on the left side, the percussion note of the

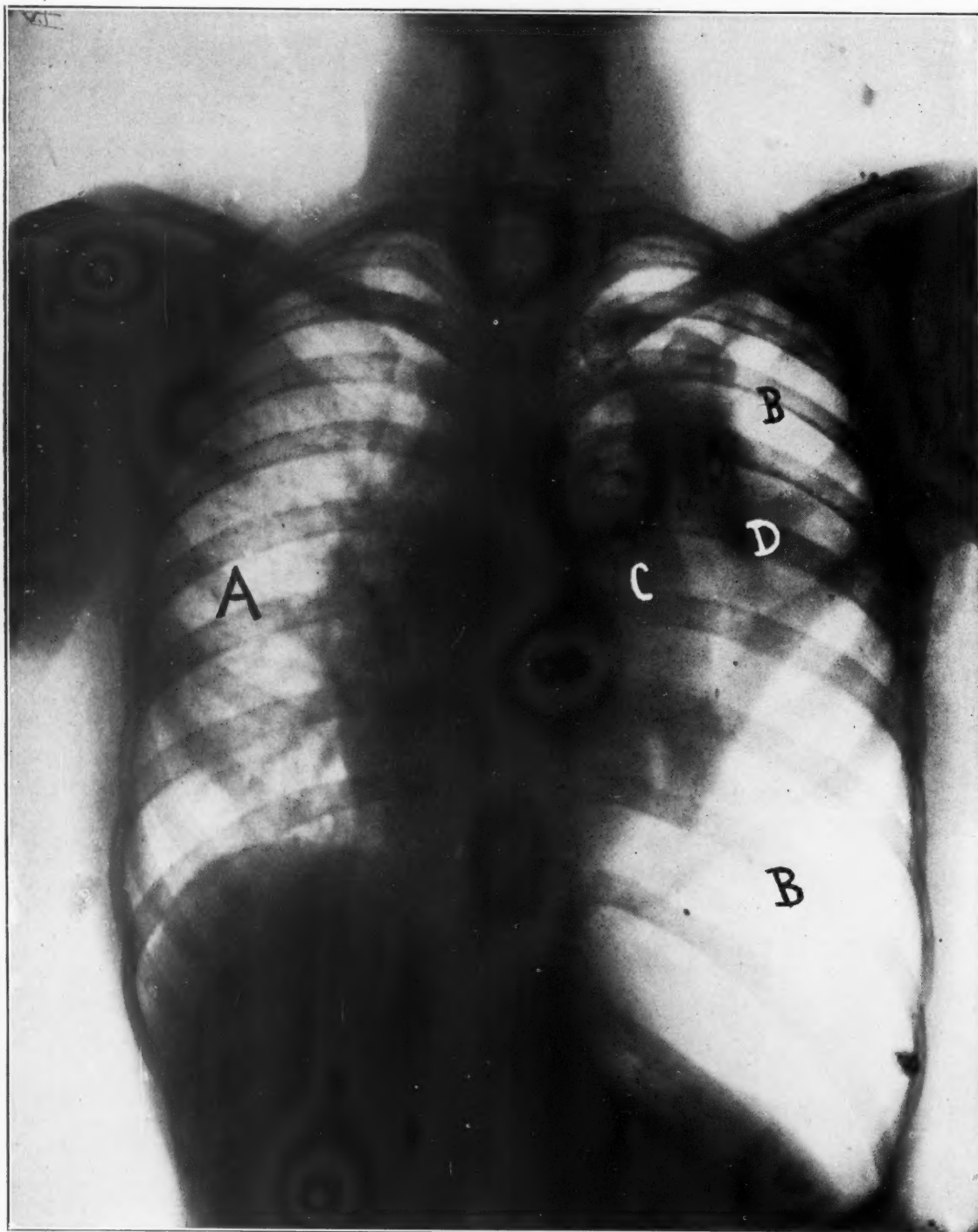


Fig. VIII. A, untreated lung. B, gas in the pleural cavity. C, the partially collapsed lung. D, adhesions holding the partially collapsed lung to the chest wall.

lobe was consolidated with a cavity below the outer half of the clavicle near the anterior thoracic wall and another at the apex near the posterior wall. Scattering infiltrated areas were found throughout the lower lobe with

right lung extended an inch or more to the left of the median line. Figure 7 shows the X-Ray examination before the first operation. It is interesting to note the considerable displacement of the heart to the left, the anterior

mediastinum having entirely disappeared under the right edge of the sternum. I succeeded without difficulty in introducing 550 cc. of gas at the first puncture. The patient stood the operations well, and at the end of five weeks the X-Ray picture showed (Figure 8) an almost complete collapse of the lung. The heart had been pushed back to its normal position and the cavity partially closed. The patient's general condition had improved wonderfully, there was but little cough and no expectoration, the temperature and pulse were normal and the patient had begun to gain in weight.

Knopf makes the statement that it is now a well established fact that artificial pneumothorax is a valuable adjuvant in the treatment of pulmonary tuberculosis; yet, in view of the possibility of an accident (not necessarily in the primary filling, for experience has shown that they are more likely to occur in subsequent fillings), every practitioner should protect himself by procuring the written consent of the patient or guardian before resorting to this method of treatment.

In conclusion, I wish to make acknowledgment of the helpfulness of Dr. Henry Hulst in the prosecution of this work. As the procedure is not entirely free from dangerous accidents and unpleasant sequelae, I do not think any one is warranted in undertaking the treatment of pulmonary tuberculosis by means of artificial pneumothorax without the co-operation of an experienced radiographer.

## BIBLIOGRAPHY.

- Jessen, *Journal A. M. A.*, Aug. 9, 1913, p. 441.  
 Zink, *Journal A. M. A.*, Aug. 9, 1913, p. 441.  
 Lundburg, *Journal A. M. A.*, Aug. 9, 1913, p. 441.  
 Saugman, *Journal A. M. A.*, Aug. 9, 1913, p. 441.  
 Rothschild, *Journal A. M. A.*, Oct. 14, 1913, p. 1324.  
 Sargo, *Journal A. M. A.*, Oct. 5, 1912, p. 1333.  
 Renon, *Journal A. M. A.*, Dec. 7, 1912, p. 2098.  
 Jaquerod, *Journal A. M. A.*, Nov. 9, 1912, p. 1751.  
 Van den Bergh *Journal A. M. A.*, March 22, 1913, p. 948.  
 Spengler, *Journal A. M. A.*, Nov. 1, 1913, p. 1079.  
 Ethan Gray, *Journal A. M. A.*, Nov. 1, 1913, p. 1662.  
 Jos. Walsh, "Prognosis of Tuberculous Lesions Involving the Whole of or More than One Lobe." *American Journal of the Medical Sciences*, April 1911.  
 M. A. Lapham, "The Technic for Compression of the Lung in Pulmonary Tuberculosis." *Southern Medical Journal*, February, 1912.  
 M. A. Lapham, "The Treatment of Pulmonary Tuberculosis by Compression of the Lung." *American Journal of the Medical Sciences*, April, 1912.  
 Samuel Robinson and Cleveland Floyd, "Artificial Pneumothorax as a Treatment of Pulmonary Tuberculosis." *Archives of Internal Medicine*, April, 1912.  
 E. O. Otis, "Artificial Pneumothorax in Advanced Cases of Unilateral Pulmonary Tuberculosis." *Boston Medical and Surgical Journal*, Oct. 1912.  
 Louis Hamman and Martin F. Sloan, "Induced Pneumothorax in the Treatment of Pulmonary Diseases." *The Johns Hopkins Hospital Bulletin*, Feb. 1913.  
 S. A. Knopf and M. E. Lapham, "Artificial Pneu-

mothorax." *New York Medical Journal*, March 22, 1913.

Lillingston, *London Lancet*, September, 1913.  
 Wm. H. Dunham and C. S. Rockhill.

## PULMONARY TUBERCULOSIS AND PREGNANCY.\*

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My interest in the subject of pregnancy as a complication of pulmonary tuberculosis was first aroused by several cases which we had soon after the opening of the Detroit Tuberculosis Sanatorium. Since then instances have rather frequently occurred and the question as to what should or should not be done is an ever recurring one. Upon looking up the subject I have found that there is by no means an unanimity of opinion regarding the treatment; indeed, at the meeting of the International Tuberculosis Congress, held last year at Rome, the most variant views were expressed, some holding the older idea that it is best in most cases to allow the pregnancy to continue; others, on the contrary, stating most emphatically that radical measures should be taken to end the gestation.

The principal question to be answered, namely, "Is pulmonary tuberculosis an indication for therapeutic abortion?", is one which must frequently present itself to every practitioner, for according to Bacon, there are in the United States, yearly, from 22,000 to 44,000 tuberculous pregnant women. Tuberculous women are rarely sterile, so that it is fair to assume, as does Bacon, that the adult ratio of tuberculosis morbidity applies to all obstetrical patients. In general from one to one and one-half per cent. of female adults are afflicted with tuberculosis sufficiently advanced to be readily recognized. Applying this ratio, we arrive at the conclusion that, in this state there are, annually, 700 to 900 pregnant women who have active tuberculosis<sup>1</sup>. Moreover, this estimate is most conservative, for it is well known that tuberculosis is more frequent in married than in single women. Furthermore, consumption is a frequent cause of death in the puerperium, as has been shown by Van Tussenbroek, who found, from the Holland statistics, that one of every three women dying after child birth, succumbs to the disease. From these facts it will be seen that the topic is an important one.

In discussing the question as to whether or not it is right to induce abortion because of tuberculosis, it should all the time be borne in mind that a very sharp distinction must be

Read before the Section of Gynecology and Obstetrics, M. S. M. S., 48th Annual Meeting, Flint, Sept. 4-5, 1913.

1. The Secretary of State writes me: "The statistics for 1912 are not yet completed. For your article, however, it would be safe to say that 65,000 births occurred in Michigan during 1912."



made between those patients who have a quiescent, or a healed lung lesion and those patients in whom the process is active, manifesting itself by a cough, slight rises in temperature, nutritional disturbances, etc. The issue has been befogged somewhat because this distinction has not always been clearly made, and this fact accounts, I think, for some of the differences of opinion which have been expressed. Moreover, the history of a lung lesion in the past, or the assumption of its presence on insufficient evidence, has far too frequently been used as an excuse by those who wish to justify themselves in terminating a pregnancy. Bear in mind, then, that in this discussion we are dealing only with those women who have unmistakable, active tuberculosis.

Furthermore, the subject is one in which it is particularly dangerous to draw general conclusions and thereby set down irrevocable rules for our guidance in every case. A careful study must be made of each patient and in arriving at a decision as to what course to pursue all the facts must be taken into consideration. In this study, it is important that at least two physicians should participate, if possible an internist and an obstetrician.

In the analysis of such a case of open tuberculosis, attention should be given to the following considerations: (1) What will be the probable effect of the tuberculosis upon the pregnancy, if the latter be allowed to continue? What are the chances of a spontaneous abortion? Will the child be healthy and vigorous? (2) If the pregnancy continue will it seriously aggravate the lung condition?

#### THE EFFECT OF PULMONARY TUBERCULOSIS UPON PREGNANCY.

In general it may be said that a severe lung lesion may exist without greatly influencing the pelvic organs. This is shown by the effect upon menstruation. Macht studied the histories of 1,600 tuberculosis women between the ages of twelve and forty-five years to determine the effect of the disease on the menses. He found that there was no change from the normal in 51.6 per cent. In the late stages there may be amenorrhea, which occurred in 27.3 per cent. Preceding the cessation, there was a more profuse flow in 4.6 per cent.

When pregnancy has occurred, spontaneous abortion may take place, but this happens rarely and only either in the case of those patients who are prone to miscarry on account of extensive lacerations and in whom the added strain from coughing is adequate to bring about this result, or secondly in those cases where there is sufficient toxemia, as shown by continued high fever to cause the death of the fetus. In a vast majority of the cases, in spite of a grave condition in the mother, the child

develops normally and reaches term comparatively unaffected. True, there are a few recorded instances of direct infection, but these are so few that they may be disregarded.

Such a child must be immediately taken from the mother and not be put to the breast even on the first day. Our whole knowledge of tuberculosis points to the slight importance of inheritance and the tremendous importance of familial infection. Stranguaard studied conditions in 89 families in which he had known 197 cases of tuberculosis. In only 23 of the 197 cases were a parent and a child affected and these could probably be traced to post-natal infection. Reiche investigated 2,864 tuberculous policy holders and came to the conclusion that there was little to point to the transmission either of the disease or of the tendency to the disease. He remarks "The dethroning of the old pessimistic theory of an inherited predisposition deprives tuberculosis of much of its horrors, as it shows how infection may be avoided and that no one is fatally doomed from birth."

On theoretical grounds one would therefore say that healthy children may be born of tuberculous mothers and if properly treated, may thrive to adult life. Among the great mass of the people, can we attain these ideal results? Experience, judging from the literature, answers no. Zirkel reports a mortality during the first year, of such children, of 58 per cent.; Diebel, 78 per cent.; Weinberg, 78 per cent.; Pankow and Kupferle, 54.5 per cent.

We may conclude, then, that the prognosis for the child, under the very best conditions, is good; under ordinary conditions, the chances are less than even that it will live through infancy. These are facts to be carefully weighed in determining the advisability of interrupting the pregnancy.

#### THE EFFECT OF PREGNANCY UPON THE PULMONARY LESION.

Many years ago it was generally held that marriage and child bearing have a beneficial effect upon consumption. Cullen, the celebrated English physician, advised marriage, and Warren, in the prize essay of 1857, says that the effect of pregnancy is undoubtedly good. A few writers at the present time express this optimistic view. Thus, Rabnow and Reicher report that ten working women under their treatment, in 1909, for active tuberculosis passed through pregnancy. The pulmonary condition showed no signs of aggravation in seven cases and of the other three patients only one lost over ten pounds in weight. Kohne reports 22 cases, none of which was mild. In 16 the lung condition actually improved during pregnancy and the puerperium. Cohn says

that in 53 out of 58 cases the pregnancy did not seem to aggravate the tuberculosis.

On the contrary, the great majority of authorities hold that pregnancy, labor and the puerperium are very liable to cause either the breaking out of what is seemingly a new infection, the lighting up of a latent lesion, or the exacerbation of an active process. Nearly all teachers of obstetrics uphold this opinion. Ahlfeld says: "For the mother with tuberculosis the advent of pregnancy is a very ominous event. Runge writes: "The feeling of comparative comfort which these patients experience during pregnancy has been taken to mean that the tuberculosis is not advancing, but in most cases this is an error. During the puerperium, such patients usually go down rapidly." Bumm and Fritsch make similar statements.

Several physicians who see much pulmonary tuberculosis have told me that it is exceedingly common to obtain a history to the effect that the patient was well until a certain pregnancy or that she did not recuperate as she ought to have done, after child birth. In other words, in a large proportion of the cases, the lung trouble is dated back to a pregnancy or to the time immediately after. Indeed, many authors may be cited on this point. Trembley, of Saranac, found that of his 240 cases, 151, or 63 per cent., gave a history of having the first lung symptoms during or immediately after pregnancy. Fishberg, of New York, obtained such a history in 107 of 286 tuberculosis married women (37.4 per cent.) and Maragliano in 59 per cent. of 285 cases.

During the early months the nausea and vomiting, together with the constipation so common during pregnancy, render the proper feeding of the consumptive most difficult. During the later months the increased abdominal pressure interferes with the excursions of the diaphragm and proper aeration of the lungs does not occur. Add to these handicaps the disturbance of nitrogen metabolism and we have decided factors which tend to aggravate the pulmonary lesion. Accurate statistics to support this statement are difficult to find, but Pankow and Kupferle, whose monograph is most complete, found that 94 per cent. of their open cases did badly. Reiche noted a decline in 77 per cent. and Freund in 38 per cent. Lobenstine says that all of his ten patients were worse, six of the ten dying within three months after labor.

It would, therefore, seem that the weight of authority favors the view that pregnancy does affect unfavorably pulmonary tuberculosis. All married women, with the disease, even though mild, should be told of this fact and warned against its occurrence.

Pregnancy having taken place, each patient must be carefully studied and each case judged

according to all the circumstances. It seems to me that there is sufficient evidence to justify therapeutic abortion, but for this to be beneficial and life saving, it must be done early. It should be again emphasized that this applies only to the cases of active progressive tuberculosis and that the operation is to be done only after careful study in conjunction with a competent and conscientious consultant.

With my present knowledge of the subject, I am not convinced that there is justification, in any but the rarest cases, for either the operative sterilization as advocated by Schottelius, Bacon, Schauta, Hoehne and many others, or for the X-ray sterilization, supported by Gauss, nor does it seem right to me either to remove the uterus and ovaries, championed more particularly by Martin, or to vaginally excise the fundus of the uterus and the placental site, recommended by Bardeleben.

The whole subject is a difficult one; experiences differ; there are many opinions. To pursue the right course, doing justice to the mother, to the child and to the other members of the family demands our most careful thought and the exercise of our keenest judgment.

#### REFERENCES.

- Ahlfeld. *Lehrbuch der Geburtshilfe*.  
 Bacon. *Jour. A. M. A.*, LIX, December 21, 1912.  
 Bardeleben. *Zent. f. Gynak.*, XXXV. p. 1085, 1911.  
 Cohn. *Beitrag. z. Klin. Tuberculose*, XXI. No. 1.  
 Deibel. Quoted from Pankow and Kupferle.  
 Fishberg. *New York Med. Jour.*, Dec. 11, 1909.  
 Freund. Quoted from Pankow and Kupferle.  
 Gauss. *Zent. f. Gynak.*, XXXV., p. 1004, 1911.  
 Hoehne. *Med. Klinik*, February 23, 1913.  
 Koehne. *Beitrag. z. Klin. Tuberculose*, XXVI., No. 1.  
 Lobenstine. *Am. Jour. Obst.*, April, 1913.  
 Macht. *Am. Jour. Med. Sciences*, December, 1910.  
 Maragliano. Quoted from Fishberg.  
 Martin. *Zent. f. Gynak.*, XXXV. p. 1041, 1911.  
 Pankow and Kupferle. *Schwangerschafts Unterbrechung bei Lungen- und Kehlkopftuberculose*, Leipsiz, 1911.  
 Rabnow and Reicher. *Deutsch. med. Wochensch.*, XXXVII., No. 22.  
 Reiche. *Munch. med. Wochensch.*, September 19, 1911.  
 Runge. *Lehrbuch der Geburtshilfe*.  
 Schauta. *Monatssch. f. Geb. u. Gynak.*, XXXIII., No. 3.  
 Schottelius. *Beitrag. z. Klin. Tuberculose*, XX., No. 2.  
 Strandgvaard. *Abst. Jour. A. M. A.*, LVI., p. 708.  
 van Tussenbrock. *Abst. Internat. Abst. Surgery*, II., p. 199.  
 Weinberg. Quoted from Pankow and Kupferle.  
 Zirkel. *Ibid.*

## DIAGNOSIS AND TREATMENT OF CHRONIC NON-TUBERCULAR JOINT DISEASES (RHEU- MATISM.)

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From time immemorial we have all struggled to treat successfully the great mass of chronic joint diseases, classed, because of our ignorance, as rheumatism. It is a comparatively recent development that we have recognized specific differences in these diseases, and thus been able gradually to classify them. The first class to be sharply separated were those caused by the bacillus of tuberculosis, either human or bovine. These will not be considered in this paper.

### CLASSIFICATION.

In 1900 Goldthwait brought out his classification of chronic joint diseases dividing them into three main classes, recognizable by history, symptoms, signs and course.

They were:

- (1) Infectious.
- (2) Atrophic.
- (3) Hypertrophic.

This classification was a successful one as it gave an anatomic basis for diagnosis, but was not strictly scientific as it depended both on etiology and anatomy. It went far to clear up the hopeless confusion resulting from the use of such indiscriminate terms as arthritis deformans, rheumatoid arthritis, and the like.

Since that time many classifications, such as that of Nathan, in which all cases are divided into two classes, the infectious and the metabolic, with divisions on the basis of etiology, have appeared.

In the light of recent developments, however, it is probable that even Nathan has not gone sufficiently far in the simplification of terminology, in that it seems to be true that all the chronic joint diseases are either directly or indirectly infectious. For convenience, however, I shall use Goldthwait's nomenclature for the purpose of description and diagnosis.

Chronic infectious arthritis includes all those cases which originate from infection of joint structures through the blood stream with active bacteria or their products. The most common example of this is the ordinary gonorrheal arthritis, or the arthritis with heart involvement following an attack of acute rheumatism. The cases all show marked systemic disturbances, temperature, high pulse rate, loss of appetite and loss of general nutrition. Locally the joints are swollen, tender, painful and stiff. They get better and worse. They may be red and contain fluid. The swelling

of the individual joint is spindle shaped. Careful examination and palpation show that it is the periarticular structures, synovia, capsule and ligaments that are primarily involved. The bone is never involved except for some atrophy, and the cartilage is involved only late, or in very severe cases. The X-ray picture shows no changes except the atrophy and thickening of the periarticular structures. As these joints progress they become deformed in the lines of their normal motion through the efforts of the muscles to hold them still. Thus knees become permanently flexed as do fingers or wrists. There is no deformity of the twisting type because the bones are not involved. Any number of joints may be involved symmetrically or not.

Atrophic arthritis clinically has few systematic disturbances except malnutrition due to inability to get about and take exercise. There is usually a large nervous factor in the patient's condition, and often the beginning of the disease dates from a mental or emotional shock. The onset of the disease is insidious and is apt to begin in the distal phalangeal joints symmetrically, and then spread through periods of months and years in a more or less orderly manner to the large joints. The affected joints are only slightly tender and not often painful until far along in the disease. There is rarely any fluid. The swelling is usually fusiform but moderate in amount. From the first, motion in abnormal directions is present, but normal motion is limited in amount. There is crepitation in the joints. Palpation and inspection show a low grade involvement of the periarticular structures, but the X-ray shows, from the first, thinning and erosion of the cartilage and early bone destruction in the neighborhood of the joints. This progresses until the joint is completely disorganized. At a late stage in the progress of the disease, new bone formation begins about the joints and it is difficult to distinguish the cases from the hypertrophic type, a description of which is to follow. In fact many maintain that the hypertrophic and the atrophic cases are merely variations of the same condition.

Hypertrophic arthritis is the extremely common "rheumatism" of the elderly with its Heberden's nodes and stiff joints. Its diagnosis is easy through the lack of involvement of the periarticular structures and the early prominences which form about the joint, evidently bony in character. Its onset is gradual and constitutional disturbances rarely occur. It may appear in hip, lumbar, spine, or knee, or any other joint, with pain as the only symptom. Fortunately the distal phalangeal joints are almost always somewhat involved and give us a clue to the diagnosis. The disease is very subject to remissions. The X-ray pictures always show



bony outgrowths varying in size from a needle point to a mass as large as a chestnut, grouped about the rim of the articular cartilage. Deformity occurs through the locking of these outgrowths, or through their pushing the bones out of normal relation. Limitation of motion always comes early.

These two types, the atrophic and the hypertrophic, are classed together by Nathan under the head of metabolic, because they seem to depend on changes in the metabolism of the patient rather than on infection. This is probably true. But to what are the metabolic changes due? It is becoming more and more apparent that these changes are the indirect results of bacterial activity, usually in the intestine, but occasionally elsewhere. Assuming this to be true, then is it not better to class all our chronic joint cases as infectious; thus keeping our attention fixed on the one element in etiology which offers us a clear guide to treatment? Perhaps we may make the dividing line clearer between these last two classes, which are themselves so different clinically, and the frankly infectious class described first, by calling them toxic; remembering always that the toxins are the result of bacterial invasion. All three types have, in common, impairment of the general health, and other general symptoms which point to an infectious origin.

The correct diagnosis of an individual case of chronic joint disease is then not extremely important from the point of view of radical treatment, because radical treatment of all cases depends on the removal of the infectious or the toxic focus. It is, however, very important from the point of view of local treatment of the single joints. The red, swollen joint of the active infection needs very different care from the stiff, quiescent joint of the elderly hypertrophic case.

#### TREATMENT.

The radical or systemic treatment of all the cases depends first on one all important step: Find the focus of infection. This focus may be absolutely anywhere; tonsils, accessory sinuses, skin, pelvis, gall bladder, large or small intestine, lungs, prostate or epididymis. We must therefore make the search with the greatest care and thoroughness at our command. Fortunately a rather large number of cases of all types are dependent on focuses in the faucial tonsils. These focuses may be so small that even an experienced throat specialist will pronounce the tonsils normal and refuse to remove them except under the strongest persuasion. So frequently have I seen this, that I make it a rule in every case, where I can obtain the patients' consent, to have the tonsils thoroughly removed. Billings of Chicago has

followed this idea to its logical conclusion, and has been able to make a vaccine and horse serum from the specific bacteria obtained from the tonsils. This he has used in many cases with extremely good results.

First, then, attack the tonsils. If they are proved not to be at fault, the search must be carried on painstakingly, and often tediously, until a source of infection is found. If found in the accessory sinuses, thorough drainage must be established, and this is equally true of the gall bladder, the prostate, the appendix, or any other organ.

Large numbers of cases originate in the activities of the various bacteria in the intestinal tract. Some time this activity appears as a true enteritis, in which case medicinal treatment of the stomach or intestines is effective. On the other hand ptosis, or intestinal kinks may allow bacterial putrefaction, with its resultant toxins. Here mechanical treatment of the stasis or ptosis is most valuable.

Often irrigations and drugs will not reach the seat of the trouble because the ptosis is a diffuse one affecting all the abdominal contents. In such cases resort must be had to orthopedic measures planned to raise the ribs and flatten the lumbar spine, and thus raise the general level of the diaphragm and intestinal tract. These measures are difficult of application, because they involve much effort on the part of the patient, and attention on the part of the physician. They consist of exercises to develop muscles, of re-education in regard to position and body poise, and often of the application of various forms of supporting apparatus. Occasionally a case is found where it is wise to short circuit or remove the whole (large) intestine.

Vaccines, serums and phylacogens if applied carefully to known infections are good. Used as they are so frequently as "shot gun" prescriptions, they occasionally hit the mark, but much more often do more harm than good.

Medicines, except those aimed to promote elimination and to improve the general health, are of little value except to relieve pain, and occasionally to protect the heart from invasion. Here the salicylates and their various derivations are most valuable.

The local treatment of the joints depends on their condition. The acute and painful infectious joint needs complete rest by fixation. In the very acute cases, I make it a practice to draw off excessive fluid or even wash out the joint. Great care must be taken to prevent deformity through contractures by means of splints. When the acute symptoms have subsided, careful massage and passive and active motion must be started early and continued persistently to restore motion of the joints. In the older joints, forced

ble manipulation may be useful, and sometimes a joint may be restored to function by arthroplasty, or other surgical procedure. In general the atrophic type of joint must be kept moving and the hypertrophic must be kept still; that is, the atrophic or destructive type of joint is not very painful, and if kept moving will often adapt itself to a position in which fair motion is possible. The hypertrophic joint, on the other hand, is painful and motion tends to hasten the increase of the bony overgrowths. This is especially true in the acute exacerbations of the disease.

The foregoing is an attempt to state briefly the present attitude toward chronic rheumatism and its treatment. Although we are still far from a complete knowledge of the diseases, and cannot always treat them successfully, yet recent progress is sufficient to make us hopeful of mastering them ultimately.

#### SUPRAPUBIC PROSTATECTOMY.\*

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Simple obstructive hypertrophy of the prostate is usually insidious in its onset. The patient comes to the physician complaining that he awakens more often at night to urinate. He finds that he sleeps better if he empties his bladder frequently. If these symptoms have not attracted his attention he may come complaining of a sudden inability to pass his urine after exposure to cold or moisture or excessive indulgence in alcohol or coitus. Even this sudden retention may pass off spontaneously, and consequently be dismissed by the patient as a trivial matter. It may appear again and again, with intervals of increasing frequency of urination and the patient may not present himself to his physician for examination until the final touches of calculus, cystitis and ascending pyelitis are super-added to his deplorable condition and complete his miserable and filthy invalidism.

The diagnosis of such a clinical picture is not difficult. Obstruction of the prostate is practically written across the face of it. The physician knows that the surgical removal of the gland is the only procedure that will offer a cure and he also knows that he is dealing with an aged patient who has an impaired renal and circulatory system. As a result he may lay too much importance to the renal or cardiac disturbances.

We have often seen cases of marked kidney diseases, cases in which albumen, pus and casts were found in the urine, clear up entirely

after drainage and removal of the prostate. These cases are not so much actual renal disease as kidney impairment due to irritation and probably back pressure. Cases of this type must really be classed as poor surgical risks, nevertheless, they should be brought to operation. As a determining factor for operative or non-operative treatment, the functional test by pheno-sulphone-phthalein, (of which we will say more later) is most valuable in giving us correct information of the real condition of the kidneys.

In the same manner the circulatory system is also remarkably improved by prostatectomy. Whether prostatic disease directly causes myocarditis, just as gall-bladder diseases or other infections are held responsible for myocardial changes by different authorities, or whether pyelitis and nephritis are the direct etiologic factors of the myocarditis, the enlarged prostate acting only as an indirect cause, we will not say. However, we have seen signs of myocardial disease, as evidenced by increased heart rate, irregularity and not infrequently dilatation, improve and entirely disappear soon after operation and that without any special treatment directed to the heart muscles. Patients with these symptoms are always bad risks and for them it is all important to make every effort by careful preliminary treatment to lessen the dangers of anesthesia and operation. Nor should such immediate changes for the better in the renal and circulatory systems cause the pendulum to swing too far towards an absolutely decided surgical procedure in all cases, for we would then many times be taking undue risks in advising operation for prostate hypertrophy.

#### THE OPERATION OF CHOICE.

The next question to be decided upon is the route of choice. We prefer the suprapubic route and in advanced cases we perform the operation in two stages.

In all operative procedures the question of mortality is of prime importance. The advocates of the perineal route claim "lessened mortality" as a great argument in their favor. Is this really a fact? It is true that according to old statistics the mortality of the suprapubic operation is very high, but does this hold today? Mortality does not depend on the operation so much as upon the functional capacity of the kidneys and the condition of the heart and general circulation, and this is the same for either method. Since we have paid greater attention to the kidneys and circulation our mortality has been materially lessened. If there is a marked cystitis, much residual urine (2 to 5 ounces) and if with the phenol-sulphone-phthalein test (6 mg. or gr. 1/10 injected intramuscularly appearing slowly and only ex-

Read before the Section on Surgery at the 48th Annual Meeting of the Michigan State Medical Society held in Flint Sept. 4-5, 1913.

# PROSTATE SIMPLE HYPERTROPHY

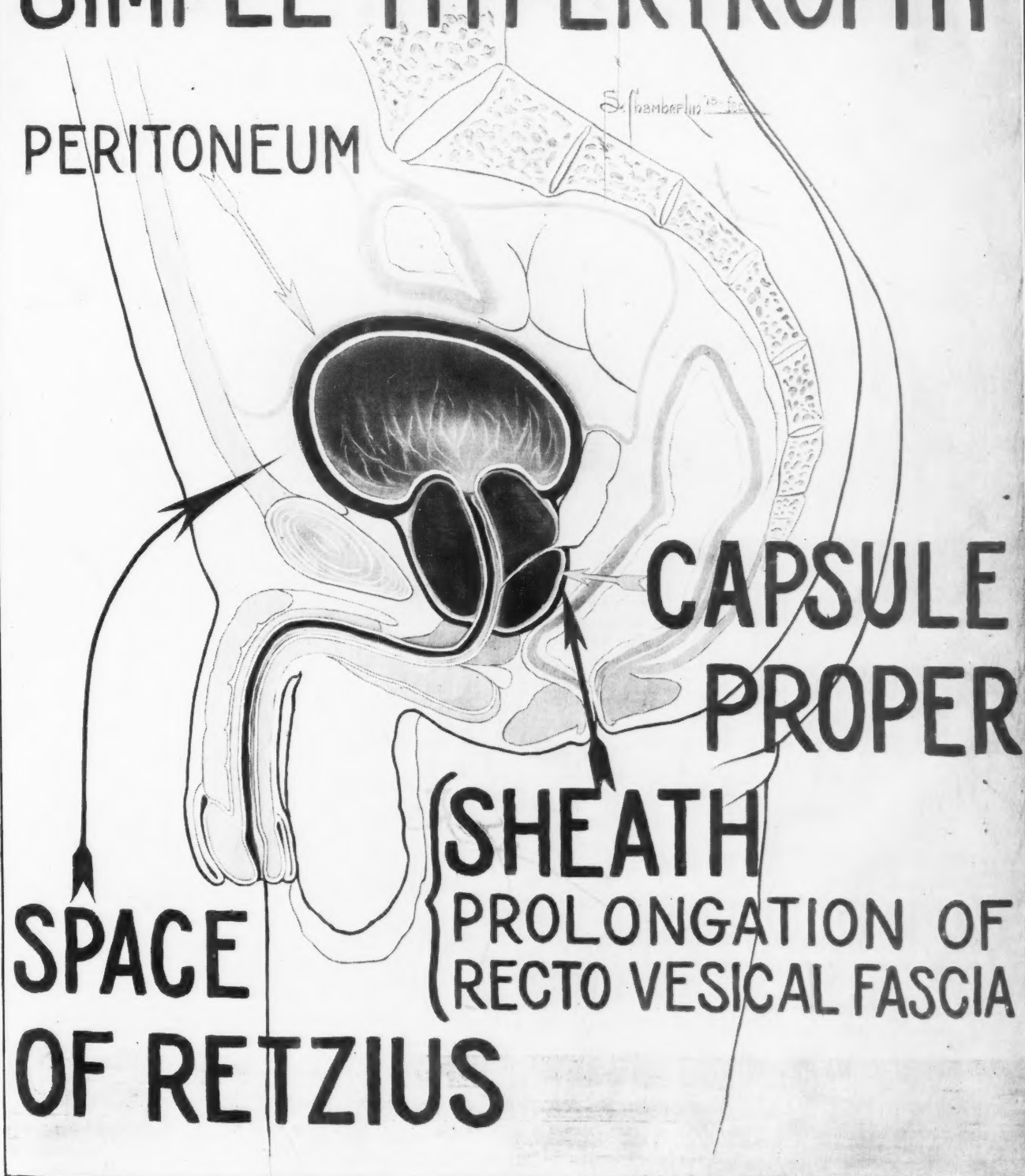


Fig. 1.



creted in the urine to the extent of fifty per cent. in two hours) a kidney insufficiency is demonstrated, we always institute preparatory treatment. This preparatory treatment consists in copious injection of water, the administration of 40 to 50 gr. of urotropin daily, repeated catheterization or better still a permanent catheter introduced into the bladder through the urethra. If this is impossible or too uncomfortable, a suprapubic cystotomy under local anesthesia is employed. With such preliminary treatment carried out for from one to three weeks the condition of the kidneys is greatly improved and the dangers accordingly immensely reduced. The removal of the prostate gland can be then safely undertaken.

#### ADVANTAGES OF THE SUPRAPUBIC ROUTE.

Easier control of hemorrhage, a greater possibility of preservation of sexual function, better drainage and more rapid closure of the wound are points which the upholders of the perineal method claim for the approach of the gland by this route; while less likelihood of incontinence of urine, less danger of injuring the rectum, and greater ease in operating and consequently of operating more rapidly are points which the upholders of the suprapubic method claim for the approach of the gland by this route.

The advantages usually claimed by the perineal route are, we believe, overestimated. If we consider them separately we can readily show our reasons for this statement.

#### EASIER CONTROL OF HEMORRHAGE.

Troublesome hemorrhage rarely occurs if enucleation is properly performed; that is if the gland is entirely peeled from out of its sheath and not the sheath and gland peeled from under the mucous membrane. When the gland is entirely removed from its capsule hemorrhage usually ceases spontaneously. The capsule is a musculo-fibrous membrane and will contract. If, however, a piece of gland tissue is left, it acts just like a piece of retained placenta acts, i. e., interferes with the contraction of the capsule and this keeps up the bleeding. Bleeding from this cause has often been the cause of great anxiety to the surgeon and as a result various gauze packs have been devised. These will rarely be required if enucleation is done entirely within the capsule. Occasionally it happens that bleeding, in spite of proper technic, does occur. This is especially so in cases which occur in prostates that have been the seat of long continued inflammation. Here the gland is so adherent that the enucleation necessitates a considerable amount of trauma. For these cases we have provided a small opening at the tip of the cystotomy staff, through

which a ligature can be passed and to this a piece of gauze is attached which can be made to fill in or pack the cavity from which the gland has been removed, by simply pulling out the staff. (See Figure No. 5.)

#### GREATER POSSIBILITY OF PRESERVATION OF THE SEXUAL FUNCTION.

This, on account of the age of these patients, is of minor importance, yet we believe the integrity of the seminal ducts is more liable to be preserved by the suprapubic operation. Tandler and Zuckerlandl<sup>1</sup> and Lorosley<sup>2</sup> have demonstrated that the posterior lobe, which very rarely enters into the hypertrophy but which is rather in a state of pressure atrophy, is separated from the rest of the gland by a distinct capsule. It is with this lobe that the ejaculatory ducts are closely connected and because this lobe is left undisturbed in the ordinary suprapubic operation for benign hypertrophy one can readily understand why the sexual state remains unchanged after this operation. This cannot be said of the perineal operation for here the operator divides this lobe in order to gain access to the hypertrophied part of the gland above and in so doing is in great danger of also dividing the ejaculatory ducts and consequently of destroying sexual power.

#### BETTER DRAINAGE.

This argument sounds well but on closer consideration it can easily be seen that it is not so forcible. Drainage of the bladder is not accomplished by gravity as would be the case for instance of draining a non-collapsible cavity. Bladder drainage is principally brought about by the contraction of the bladder itself and by the intra-abdominal pressure, increasing and diminishing in a wave-like motion with each inspiration. The great mistake in cases where drainage through the suprapubic wound is faulty, is the use of a small calibre tube, and of inserting the tube too deeply in the bladder. Formerly we had a little difficulty in this respect but since using a very large calibre tube ( $\frac{3}{4}$  inch in diameter) and since inserting it only an inch beneath the anterior bladder wall, we have had practically no difficulty in draining the bladder suprapubically.

#### MORE RAPID CLOSURE OF THE WOUND.

This is probably the one great argument in favor of the perineal operation. It is true, that perineal wounds do very often close more rapidly but what about the incontinence of urine that so frequently accompanies this operation? Of this we will speak later.

1. Folio Urologia, March 1911.

2. Am. Jour. Anat., July 15, 1912.

# ENLARGED CENTRAL LOBE POOL RESIDUAL URINE

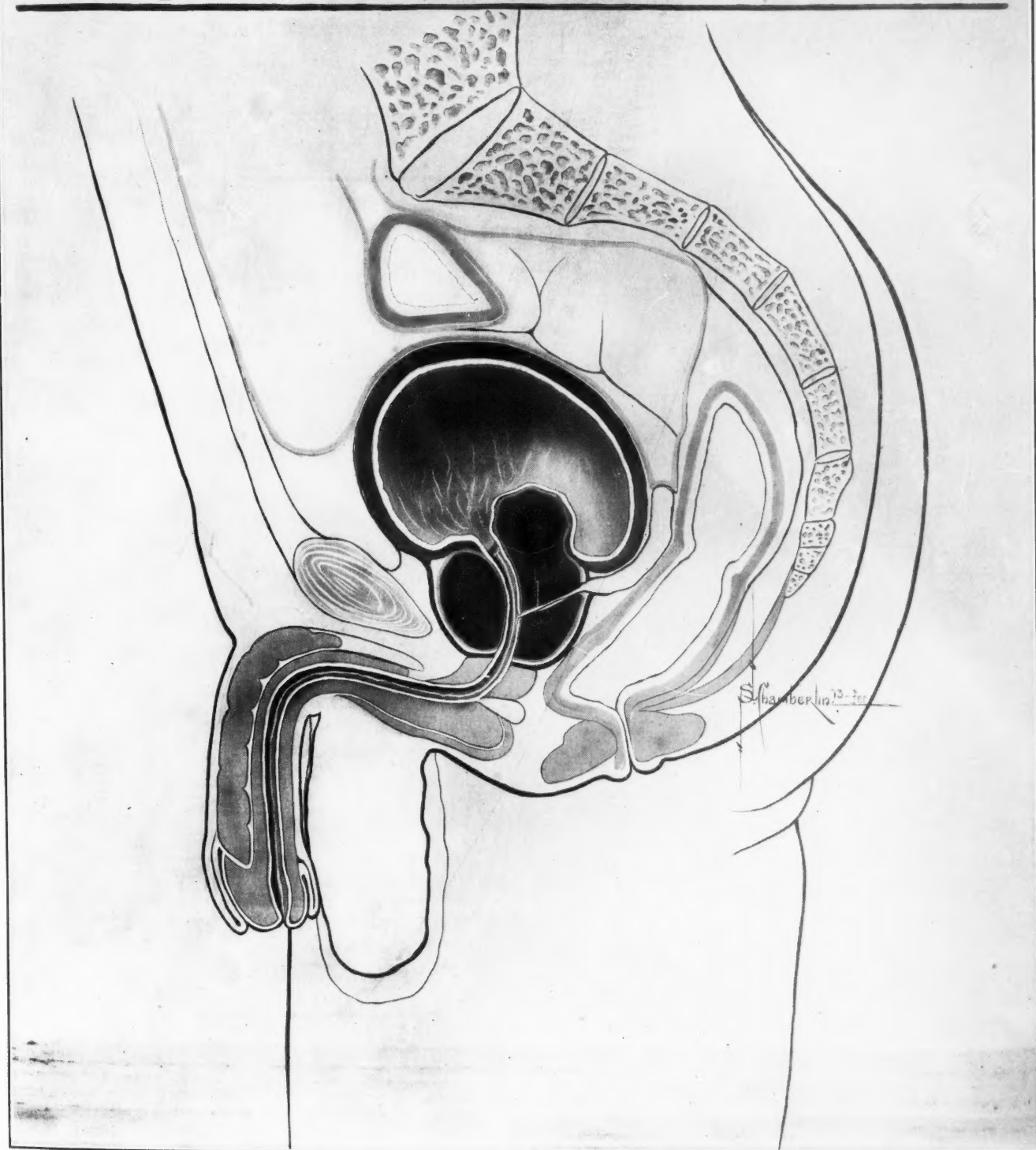


Fig. 2.

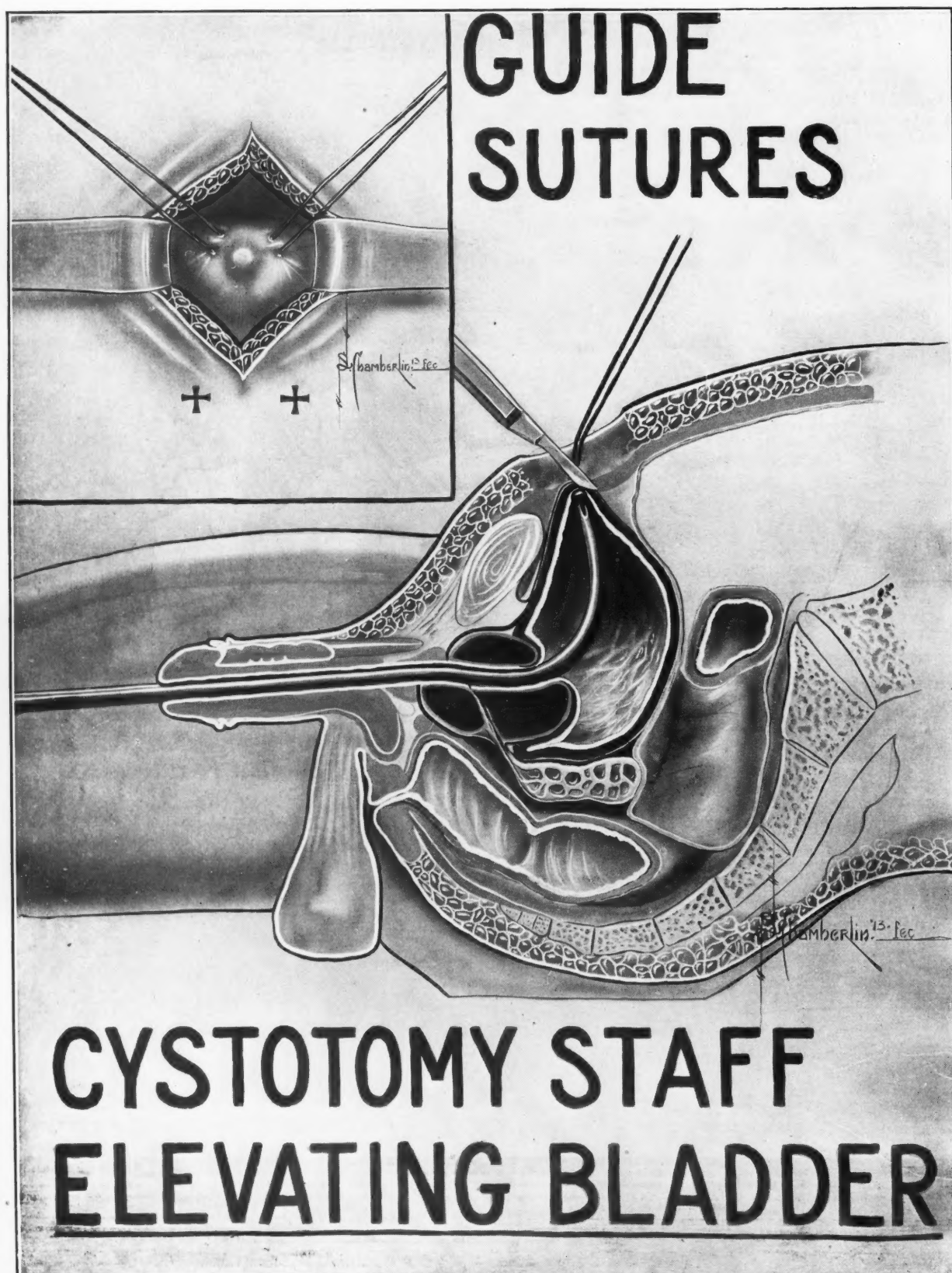


Fig. 3.

## POST-OPERATIVE COMPLICATIONS.

Besides mortality the functional results that follow any operation should ever be prominent in the mind of the surgeon. In the treatment

of these cases, the ability of the patient to empty his bladder and more important still his ability absolutely to control the flow of urine is the functional result we seek to obtain. Can this be obtained by either operation? In the



suprapubic, yes, for in none of our suprapubic operations has there been any difficulty in controlling the stream; in the perineal operation this result can be obtained in a large percentage of cases but it is quite impossible to determine which cases will have absolute control and which will have only partial control or complete incontinence.

Incontinence is caused by injury to the "cut off muscle" or its nerve supply. In the perineal operation, this muscle, (the compressor urethra) and its nerve, (the perineal branch of the internal pudic nerve) are very apt to be cut or in some way injured. By this route it is almost impossible to avoid injuring these structures to a greater or lesser degree and as a result we get an incontinence of urine, which, depending upon the nature and extent of the injury, will be partial or complete, temporary or permanent. It is incontinence of urine which has caused so many patients to defer the operation until the damage to the bladder and kidneys, caused by the obstructing enlarged prostate, is practically irreparable.

A recto-vesical fistula is a post-operative complication which in suprapubic operations is practically unheard of. In the perineal, however, from the anatomical position of the operative field, this complication is not so rare and has occurred in the hands of the most able surgeon.

Besides eliminating incontinence and recto-vesical fistula the suprapubic method offers another advantage which is all important—especially when operating upon the aged and prostatectomies are practically always performed on this class of patients—i. e. greater ease in operating and consequently of operating more rapidly. We believe the suprapubic operation can be done in half the time it requires to do the perineal. The bladder can be opened in one or two minutes and the enucleation at once begun. The completed operation should not take longer than ten or fifteen minutes.

#### TECHNIC EMPLOYED.

The technic we employ is as follows: Nitrous oxide and oxygen anesthesia with a preliminary dose of morphine and atropine is the anesthetic we prefer because it is not followed by nausea. It permits the patient to take liquid and other nourishment soon after being returned to his bed.

The bladder is cleansed and emptied. The cystotomy staff (Fig. 3) is then introduced and the end pushed well up against the anterior bladder wall. A short incision one and one-half to two inches in length is made just above the pubic bone. Fascia and muscle are divided when the cystotomy staff will be seen and felt pushing the anterior bladder wall up into the wound (Fig. 3.) The peritoneum is

pushed back and well out of the field of operation. Two guide sutures (Fig. 3) are now placed into the bladder wall on either side of the projecting point and the bladder is quickly opened between these directly on the tip of the staff. The index and middle finger of the bare right hand are now introduced into the bladder, the assistant drawing the staff out in front of them while the index finger of the gloved left hand is lubricated and inserted into the rectum. (Fig. 4). While the finger is being inserted into the rectum the fingers in the bladder are exploring it for stone. The finger in the rectum now raises the gland upward to facilitate enucleation. In beginning the enucleation, experience with these cases is a great asset to the surgeon for sometimes only one large projecting lobe causes the sole obstruction and the removal of it may be all that is required. It can be made to peel out just as one can peel out a subserous fibroid of the uterus. (Fig. 4) It has, as it were, a surgical capsule of its own. In the ordinary so called general hypertrophy (Fig. 2) we use the method of Kreyer as modified by Squier. With this method the index finger in the bladder, instead of being forced through the capsule of the most prominent portion of the gland, is inserted far into the urethra. When the anterior portion of the enlarged gland is felt, the finger is pushed through the urethral mucosa. By this time the internal sphincter, already dilated by the enlarged gland, is still more dilated and is not severed. The finger is not only pushed through the mucosa but also (and that is very important) through the capsule. This procedure is performed first on one side then on the other and then posteriorly, when the enlarged lobes will be delivered into the bladder. The urethra will tear at its weakest point which is just above the ejaculatory ducts. This procedure leaves the posterior lobe intact and at the same time preserves the ejaculatory ducts. Irrigation thus far, except for the initial bladder washing, has not been used. If clots form quickly these are sometimes washed away but more often wiped away with dry sponges. When the bladder is well cleaned a large drainage tube ( $\frac{3}{4}$  inch) is inserted to the extent of an inch or inch and a half. Inserting the tube too deeply will cause spasm of the bladder wall. The guide sutures are now tied across the incision in the bladder wall; four or five catgut stitches are used to close the bladder tightly around the tube. The muscle and fascia are drawn together in the usual way and two or three silk-worm gut sutures complete the operation.

#### POST-OPERATIVE TREATMENT.

The after treatment is comparatively simple. Here meddlesome interference and fussing does

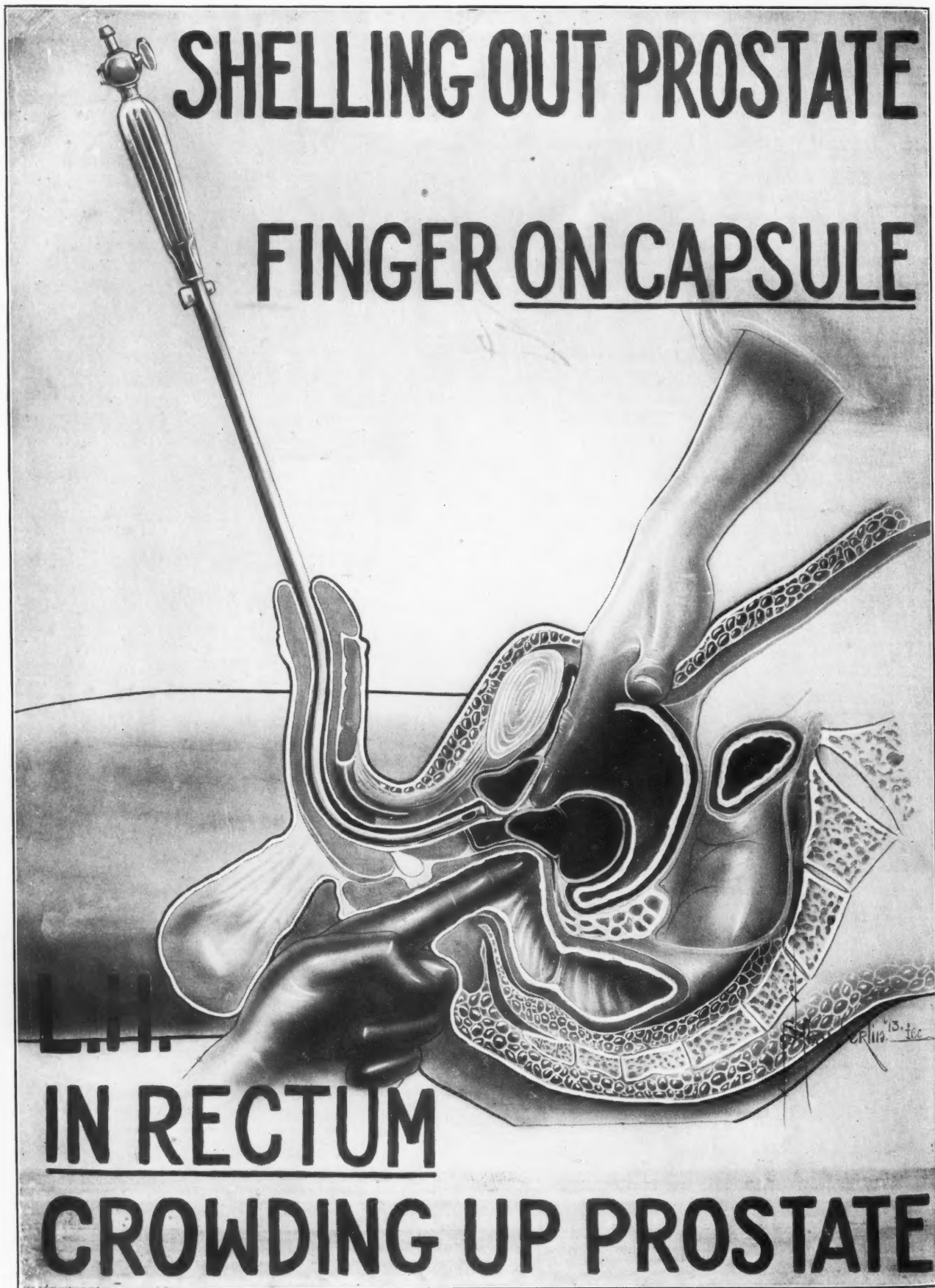


Fig. 4.

more harm than good. If the drainage tube is properly inserted and is of proper size, there will be free drainage and irrigations and washings as absolutely contraindicated. Copious injections of fluids per rectum for twenty-four hours and by mouth as soon as the patient's stomach will bear it (which if nitrous-oxide, oxygen has been used is usually in two or three hours) is the only flushing that is necessary. If with these measures the urine still remains highly acid, with a tendency to the formation of uric acid crystals around the wound, then the internal administration of urinary alkalies (potassium acetate, potassium citrate or liquor potassae,) is indicated. No amount of bladder irrigation can supplant the internal administration of alkalies and no amount of bladder irrigations will prevent the accumulation of uric acid crystals. All that is necessary, as far as local treatment is concerned, is a change of dressings should the urine leak along side of the drainage tube. The drainage tube is left *in situ* for from six to nine days; after removal of the tube the urine will still escape from the suprapubic wound and it will then be necessary to change the dressings every two hours. At the end of the second week the patient is encouraged to urinate. Before this time it is not well to force urine over the prostatic site which is covered only by granulations. Complete healing of the cavity from which the prostate was removed requires longer time but at the end of the second week, healing has sufficiently advanced to allow urine to pass over its surface. At the end of the third or fourth week, and at longer intervals after, it is well to pass a soft catheter or a sound (very gently) into the bladder to insure a good opening of the vesical end of the urethra. Local treatment other than this is uncalled for and we believe really harmful.

It is generally conceded that old patients withstand the recumbent position poorly and for this reason it is well to place them in the sitting position as soon after a prostatectomy as is consistent with their general condition which will usually be on the second or third day.

#### CONCLUSIONS.

In summing up we would say: That for the ordinary prostatectomy the suprapubic operation is the method of choice. It has a low mortality; it will insure control of the flow of urine; and can claim all the advantages that the perineal method can claim except, perhaps, that it requires a little longer time for the closure of the urinary fistula. Its success depends: 1st, Upon the preliminary treatment with copious amounts of fluids, urinary antiseptics, and in some cases bladder drainage either by catheter or a preliminary cystotomy;

2nd, Upon rapid execution of the operation itself with ample provision for free drainage; 3rd, Upon non-meddlesome after-treatment, which simply means copious injection of fluids, early sitting position and the administration of alkalies if indicated to control urinary acidity.

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#### DISCUSSION.

DR. JUDD, ROCHESTER, MINN: I enjoyed Dr. McLean's paper very much; I think he has emphasized the important points as we have seen them. I think the first point that he emphasized so strongly was the two-stage operation, or two-stage treatment in these cases. I believe that that is the one thing that will reduce the mortality in prostate work more than anything else. Of course, it is not necessary to do a two-stage operation in all cases; but in case of low specific gravity, and a great deal of residuary urine, we are able to accomplish a great deal; whether it is the relief of the back-pressure on the kidneys, in withdrawing the residuary urine or whether it is some change in the absorption, to the bladder, I do not know. We do know that catheterization of these old men—we know that frequently one or two catheterizations will drive them into a uremic condition. Recovery from the withdrawal of this residuary urine frequently does not come for more than a week or ten days.

It is an interesting picture I think, to follow these cases: A man will come into the office with six or eight ounces of residuary urine, due to an enlargement in the prostate, and if we have a recent examination, which is not always the case, we think that probably he is a pretty good risk; we catheterize him; and again may be in two or three days, or the next day have a specimen of the urine examined, and almost invariably the specific gravity will have dropped several points—sometimes down to 1005 or 1004; and within a week, or perhaps the next day or so he comes in and says he has not been able to sleep, and he has lost his appetite. I think we can get rid of these nervous symptoms. The condition we do not understand still, is being able to judge technically. We do not see mortality from the technic of the operation; hemorrhage for instance, we know how to control, and seldom have a hemorrhage that is at all alarming. We know how to manage the sepsis, so that we seldom see an infection that amounts to anything.

I believe that Tandler has probably shown us something in saying that in doing what we call prostatectomy we do not remove the prostate at all; we take the edema from the prostate. It may project bi-laterally, the enlargement, into either side—the lateral lobes, and the posterior lobes—so that what we call the capsule, the surgical capsule, probably is a prostate gland. Tandler has a great many specimens in his laboratory in Vienna, and practically proves that.

DR. WM. FULLER, CHICAGO: I have not much to add to this discussion but would like to say a word or two with reference to the preliminary treatment of these prostates. I believe that the outline that the doctor gave us as to the two-stage operation is all right sometimes; but I believe that in many cases though, that occur spontaneously, or rather suddenly, if it is possible, as Dr. Judd said, to catheterize the patient, and have a careful irrigation of the bladder, within three or four or five days it will so completely relieve the symptoms of the patient that an operation will be completely outside



# GAUZE PACKED IN PROSTATIC CAVITY

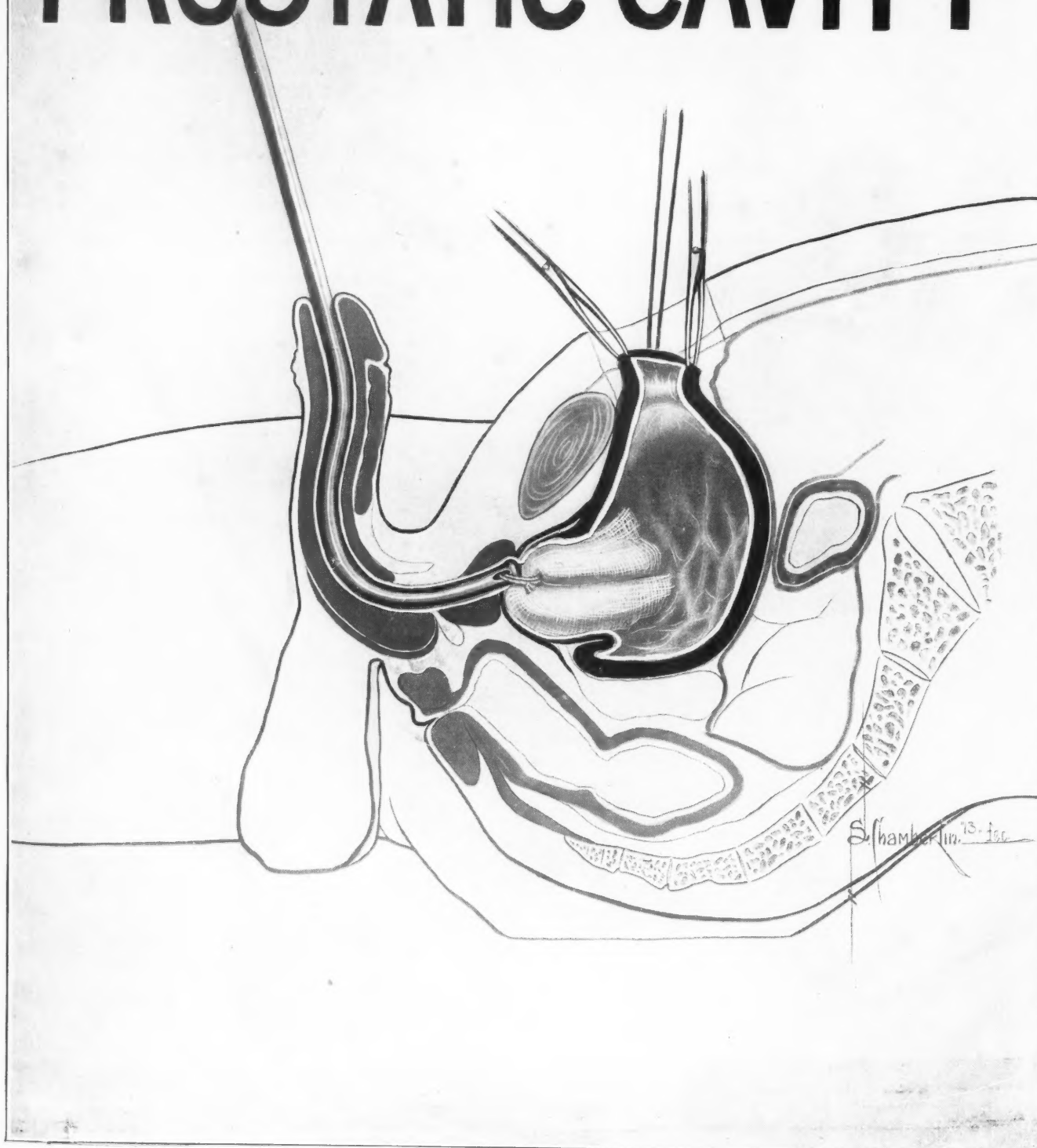


Fig. 5.

of consideration at all—that is to say the patient improves so markedly sometimes that he will not consider the operation at all.

I do not believe the size of the prostate necessarily creates an indication for operation. We have often seen prostates very markedly enlarged with no obstructive symptoms at all and when obstructive symptoms do come on, we find that irrigation will (which is done with nothing but sterile water, or a normal salt solution, or something of that kind) do this work alone, and we will be cheated out of an operation; the patient improves so markedly that he will not consider an operation at all. I think that where an operation is to be done it should be suprapubic; and I think the operation that the doctor described about draining the bladder is all right. But I believe in these cases that occur very suddenly, where the obstructive symptoms are so marked, and mostly in old men, past sixty-five or seventy years of age—I believe in these cases the operation should be perineal. First, because it is an operation that can be done just as quickly, or a little bit quicker I think, perhaps, than the suprapubic operation. I believe the necessity of preserving the sexual functions in a man seventy years of age is not important.

Now, I think that there are fewer dangers in the perineal operation than in the suprapubic operation. I believe that perineal prostatectomy properly done is not a severe operation, and is a quicker operation than drainage of the bladder, and I think this has been proved.

DR. DEAN LEWIS, CHICAGO: I am very glad to hear Dr. McLean's paper and I believe we are all coming to the idea that suprapubic prostatectomy is the operation of the future. It seems to me the way we increase our results as far as minimum mortality and permanent recovery is concerned, is by increasing our indication for prostatectomy and doing that earlier..

I was very much surprised to hear Dr. Fuller state that so many of these patients recovered after irrigation of the bladder because the more I see of prostatectomy the earlier I operate on them. When I am going to do the operation, after irrigation of the bladder, I often wonder what other surgeon did the operation, after the patient has left me because I very often think that they go to some one else.

As far as the technic of direct suprapubic prostatectomy is concerned, it is very simple. I do not know of any simpler operation than enucleation of the prostate. The only place where we have trouble is choosing the patients. Some men are very old at fifty years of age and some men are very young at seventy; where you have a man with arteriosclerosis, I think that is the main indication against your operation, and it is the only indication that may make a man do a catheterization or irrigation of the bladder for any length of time. As far as after-treatment of prostatectomy is concerned, the simpler, the better. I cannot agree with Dr. McLean when he thinks that a large tube is necessary for drainage in suprapubic prostatectomy. I think a large hard rubber tube that is advised in many cases by many surgeons after removal of the prostate is absolutely wrong.

It has been my custom for the last three years to use a small cigarette drain passed in the prostatic pocket and a small drain passing in the pre-vesicle spaces; both drainage tubes are removed within twenty-four hours, and that ends the after-treatment of prostatectomy. There is no irrigation of the bladder or anything done following that. The suprapubic opening generally lasts about four-

teen or nineteen days on an average; and the only real serious trouble I have ever had with prostatectomy is in cases in which the bladder opening closed on the third or fourth day, and urination was started early; because stretching the prostatic pocket in those cases has caused considerable inter-vesicle hemorrhage which is of very great discomfort to the patient afterwards.

DR. TOLLES: I would say that I have done the perineal operation until I had some anatomical work with Professor Tandler that has been mentioned, and he convinced me that the perineal operation is not correct. In my experience, since I have been thoroughly satisfied that the suprapubic is the operation of choice in these cases, I believe that the one little thing which I guess was overlooked by the author in the technic of the operation is indicating the route plainly and dissecting out this tumor in the prostate. If you get through the mucous membrane to the bladder it comes out very easily; but in the hands of the amateurs, sometimes they fail to get into this place, and they have trouble. I think that is the only one little difficulty I have had in the technic, which of course will be simple to the man who has had a wide experience in the removal of the prostate gland.

DR. REYCRAFT: I have taken a great deal of interest in the paper that the doctor has given us because it is a matter that seriously confronts us, and we do that operation at times. It is all right perhaps for men who are in large centers and who see a great deal of it but those of us who are not in these large centers and have to do this operation, we have to think of some other means than what have been indicated by these men that have spoken. Had I made the charts that are made there I think I would have started prostatectomy from the perineal side. Those were made, it seems to me, from the point of the man who operates suprapubically. I do not believe, if the chart was made with the prostate a little nearer the surface in the perineum, but what that would be convincing that the perineal route probably was the best. We are not always satisfied that we get in through the side, for instance, and often we find that the perineal wall will come down. If we get in there and get the urine off it is all right.

As far as I am concerned, I always have done the perineal operation, and always thought it was the best. I have not had very much experience and when it comes to opening the wrong side of the rectum, and going up in there, there is one thing certain, that for the hemorrhage we get, we have drainage for it. Leaving the bladder open on the upper side, I cannot see but what you are going to have perhaps a dangerous fistula from the inside.

As far as the operation is concerned and the time of the operation, in some places it may be all right for a man to make the first operation of draining the bladder; but in little centers the people wonder why we have not completed the operation, and nine times out of ten will almost desert you, or ask you very many questions that you do not want to answer. The important point is not to make two operations. I do not believe the people would stand for it, and I do not believe there are many of the surgeons here that are talking this morning that make the second operation. I do not believe, further, that there is a man here that has spoken this morning but what removes the whole prostate when he starts to do it. I would like to ask some of the gentlemen that have talked here how many times they did not deliver the three lobes. I think you are wrong to talk one thing and do another. Do your work, that is the way I believe, gentlemen, and you get there.

As far as the time of the operation is concerned, any man who takes over twenty minutes in doing an ordinary prostatectomy, by the perineal route, is taking too long a time. I do not think any man, to go through the perineal way, and stretch the muscles there and get in should take more than fifteen or twenty minutes, in which time I can do it myself—and the doctor here claims that that is what he takes for the suprapubic. Now, as the matter of time is concerned I think that any surgeon that has operated, can do the perineal operation—go through the perineal route in the desired time.

I have no intention of taking up much of your time, but I do like the lower route, as far as I am concerned, and I think that if the man who writes this paper would turn around, and for the next dozen cases do it the other way, he might be a man who would himself desert the suprapubic route and get back to the old way of doing things. I like the drainage; I like the urination to follow out from it, and as far as a fistula remaining in the perineum I will tell you I don't believe there is any of you here that have done a complete enucleation of that kind, of having been troubled with the fistula opening, and drainage of urine in the perineum longer than two months at least, at the most.

DR. CARSTENS: I would like to ask the last gentleman if he ever tried the suprapubic route?

DR. REYCRAFT: No sir, I have not.

DR. CARSTENS: "No sir." And that is just it; you are asking the other man to try your route, and you won't try his. Now you believe that all these men are wrong. A man that has only tried one route is not capable of judging the other ones, or discussing it. The only one that should discuss it is the man that tries them both. I believe that there are cases where one route is better than the other; because sometimes the prostate comes away down, and you can easily get it out by the perineal route, while in the other cases it is up towards the bladder, and you can get it out a great deal better with the other method. The general experience is that the suprapubic route is the best; but you must try them both.

DR. WALKER: Unlike Dr. Reycraft, perhaps, I have done this operation by both methods, and I have come to prefer the suprapubic method rather than the perineal. I think in all this work there is a personal element. When I have seen Dr. Young do this operation by the perineal route, in his most expert and artistic manner, I naturally feel that if I could do it that way as well as he does that that would be the way to do it. But in my experience I think the suprapubic method is the one of choice.

#### DISCUSSION OF HEART BLOCK WITH REPORT OF CASE.\*

MARTIN A. MORTENSON, M.D.  
BATTLE CREEK, MICH.

During the last few years a great deal of attention has been given to the pathological physiology of the heart, especially to the arrhythmias. This has been due in a large measure to the recent ideas advanced concerning the mechanism of the heart beat based on the transmission of the impulse from the sinus

nodes through the auricle and bundle of His, or auriculo-ventricular bundle. Heart block refers to an interference or disturbance in the transmission of the impulse through this bundle.

From a historical point of view it may be of interest to know that the symptoms of what we now recognize to be heart block were first reported by Adams in 1827. His case was that of a revenue officer with a pulse rate of 30, complaining of cough, fainting and "apoplectic attacks," during which the pulse rate became even slower and recovered without paralysis. The same year Burnett reported a similar case in even greater detail and referred to Morgagnis, who in 1761 reported two cases of "epilepsy with slow pulse." Stokes described a case with considerable care and detail in 1846 and since then the "Adams-Stokes-Syndrome" has become a permanent symptom complex in medical literature. These observers had no definite conception of the pathology of this condition, and as far as the heart was concerned only noted the slow pulse rate.

In 1882, Chauveau described a case with a pulse rate of 24 per minute, with occasional attacks of vertigo and loss of consciousness. He went a step farther and noted that while the ventricles beat 24 per minute the auricles were beating at the rate of 66 per minute; showing an auriculo-ventricular dis-association. He experimented on a horse and found that on stimulating the vagus the auricles beat faster than the ventricles, and hence ascribed the dis-association to over stimulation of the vagus. The next step in elucidating the pathology of these cases was taken by Ludwig and Gaskill when they showed the impulses were blocked between the auricles and ventricles. They supposed the trouble to be in the nerves.

Up to 1893 it had been denied that there existed any muscular connection between auricles and ventricles, but at this time Stanley Kent demonstrated there was a small muscle bundle connecting auricle and ventricle. About the same time and independent of Kent, Wm. His Jr., described a muscle bundle between auricles and ventricles in the mouse, dog and man, and since then the group of muscle fibers has been commonly known as the bundle of His.

I was led to report this case of auriculo-ventricular dis-association because of the extreme symptoms that developed during "Adams-Stokes Syndrome." After a rather careful review of the literature I have been unable to find a single case where the pulse beat was absent for more than 50 seconds and the patient still survive.

#### CASE REPORT.

HISTORY: Mr. T. J. S. entered the Battle Creek Sanitarium December 31st, 1912, age 43, merchant

\* Read before the section on Medicine at the 48th Annual Meeting of the M. S. M. S., held in Flint Sept. 4-5, 1913.



by occupation. Family history negative. Had the milder diseases of childhood, diphtheria at 18 years of age; at 21 had left sided pneumonia or pleurisy. No sore throat or fevers. Has had no rheumatism except some pain in shoulder joints that he thinks rheumatic in nature. Denies venereal infection. Has never used tobacco, liquor, tea or coffee. Patient has been a rather hearty eater, especially during a period of ten years when he was an iron moulder by occupation. Dates present trouble to a little over a year ago when he had a week's illness, suffering a good deal of pain in stomach. During this period one day while at dinner he suddenly became dizzy, unconscious, and fell out of his chair. Has been told that he had some convulsive movements during this spell. He regained consciousness in a few seconds and says he experienced no pain before or after the attack. In the course of a few days regained his usual vigor and attended to his business until about three months ago, when he had another spell, similar to the above, in his place of business; a little later had a third attack on the street. Five weeks ago was forced to quit work on account of these mild convulsions, because they increased very much in frequency and severity. The last two or three weeks has had them at intervals of ten minutes to an hour apart during the day. Has had occasional days when very little trouble was experienced, and until a couple of nights ago had no convulsions during the night as far as he knows. Has been compelled to remain in bed or in a reclining position almost continuously the last five weeks. If he raises his head he becomes dizzy and faint, a condition he always notices when an attack is coming on. He has recently learned from his physician that his pulse has been very slow during these attacks and that for the past three years his pulse has been in the neighborhood of 40 or less per minute. Still complains of some pain in the stomach at times after eating. Appetite has been fair. Belches considerable and when he has much gas in the stomach or bowels the attacks are much more frequent and more severe. The bowels have been constipated for years and he has been forced to depend on laxatives or enemas to obtain proper evacuations. Has never had any headache.

**EXAMINATION**—Frame is medium size; muscles are well developed; nutrition is below normal; complexion is sallow; mucous membranes anemic; tongue is dry and badly coated; teeth in fair condition; chest is well formed; expansion is fair. Percussion gives hyper-resonance anteriorly. No examination of chest posteriorly because of extreme weakness of patient. Respiratory sounds harsh but no definite rales are heard.

**THE HEART**—No precordial bulging. Apex beat is palpable in fifth intercostal space, mid-clavicular line. The pulsations range from 8 to 12 per minute and correspond to the pulse rate in both radial and femoral arteries. The pulse is strong and voluminous. No impulse could be felt between these beats. In the neck very slight waves could be seen beating at a rate of about 80 per minute. Percussion of the heart revealed only slight increase of cardiac dullness to the left, due to the heart being well covered with lung tissue. Heart sounds are very distinct at the apex, but no sounds could be heard between the visible and palpable beats, and no murmurs are heard. Second pulmonic sound is slightly accentuated. There is no edema of the extremities. Abdomen is rather flat. Some tenderness in the epigastrium with tympany over the stomach. Liver dullness extends from fifth rib to one-half inch below the costal margin and can easily be palpated. Spleen is not enlarged. Reflexes are normal. No convulsions occurred during examination.

**JANUARY 1ST., 10 A.M.**—Spent some time in patient's room and found pulse rate 18 to 23 per minute with absolutely no evidence of cardiac activity between the beats except occasional waves, that could be seen in the neck. During an hour's observation several convulsive seizures occurred. After a series of fairly regular beats the pulse would stop completely for periods lasting from 15 to 65 seconds; with cessation of the pulse the patient would begin to turn pale and as this progressed unconsciousness gradually developed, the pupils dilated to an extreme degree, respirations changed to the Cheyne-Stokes variety and a mild convulsive seizure would develop involving the muscles of the face and arms, and some times a stiffening of the legs. The eye balls rotated to the left and upward. By this time the patient would be extremely pale, in fact, the face appeared bloodless. The convulsive seizure would cease and one would be justified in thinking the patient dead. At this point an unusually vigorous apex beat was seen and immediately the face and hands would become congested with blood. The suddenness of the change from extreme pallor to congestion was not only interesting but amazing in degree. With the return of the blood to the skin the convulsions would cease and the patient would regain consciousness, and usually complained of a feeling of exhaustion. During these attacks there was no evidence by palpation of cardiac activity as far as the peripheral arteries or apex were concerned. Auscultation revealed no heart sounds whatever. Pulse tracings taken during the attacks were unsatisfactory, because of the convulsive movements, but there was certainly no evidence of ventricular activity. A small wave appeared that might be interpreted as auricular in origin. Tracings taken between attacks showed the pulse rate varying from 12 to 24 and in one or two places small waves were produced between the ventricular waves that might be considered auricular.

After observing several of these attacks I gave one-one hundredth of atropin hypodermically and for about an hour no attacks occurred, but the pulse rate continued to remain under 20, and some of the time as low as 8 and 10. I urged the patient to take a little milk and in a short time the attacks began to recur in which the periods of ventricular activity averaged a longer duration than before attacks were observed by myself and colleagues, in which there was no ventricular activity from 43 to 65 seconds.

January 2nd, 36 hours after entrance to the institution, the patient died in one of his attacks, after having had between 45 and 50 attacks during the period of observation.

#### DIAGNOSIS.

A diagnosis of complete heart block was made in this case because of the very slow pulse, the frequent occurrence of "Adams-Stokes Syndrome," the observation of a pulsation in the neck having an entirely different rhythm than that observed in the arteries. The injection of atropin did not change the pulse rate or alter the "Adams-Stokes Syndrome." In making a diagnosis of heart block as a rule we depend first of all upon polygraphic tracings and note the A-C interval in the jugular tracing. If this is more than 2/10 of a second in length it is considered that the transmission of impulse from the auricle to the ventricle is delayed and in cases of complete heart block

we often find the auricular wave in the jugular occurring independently of ventricular contractions. Another means of diagnosis is a fluoroscopic examination in which the contractions of the auricles and ventricles are timed and in that way the rhythm can be determined. Perhaps the best diagnostic means that we have at our disposal is the examination with the electro-cardiograph. This shows the auricular and ventricular contractions independently and the rhythm of each can easily be determined in this way. Unfortunately, none of these measures could be used in this case.

The occurrence of the "Adams-Stokes Syndrome" alone does not always justify us in making a diagnosis of disease of the auriculo-ventricular bundle, because cases have been reported by good observers in which we must still consider over-stimulation of the vagus capable of producing the syndrome. The syndrome is evidently due to cerebral anemia, the result of ventricular stoppage and may occur at the beginning of complete block, in the midst of complete block, as in my case, or by over-stimulation of the vagus. Complete heart block and "Adams-Stokes Syndrome" are by no means synonymous, as the term heart block only refers to the dis-association between auricles and ventricles and when they beat at independent rhythms, then heart block is complete. Partial heart block varies from a simple delay in the transmission of the impulse to a loss of some of the impulses, one out of two auricular contractions passing through, or it may be one in three, four, five, or six, giving us the varied rhythms of auricles and ventricles. Another disturbing factor in this cycle of transmission of the impulse may be a lack of susceptibility of the ventricles to the stimuli and consequently an independent ventricular rhythm is established. Gossage of London reports a case in which this seems to have occurred. Independent ventricle rhythm usually varies from 30 to 40 beats per minute.

We are prone to think that heart block only occurs in the latter decades of life; it is true it is much more frequent in old people, but it may occur in early life. Fleming and Kennedy of Glasgow report a case of diphtheria in a child 10 years of age, in which there was an acute inflammatory condition of the heart muscles and auriculo-ventricular bundle, producing complete heart block, cardiac failure and death. In a broad sense the etiological factors in heart block may be said to be anything that causes a degeneration of the myocardium and in any way involves the auriculo-ventricular bundle; and this degeneration may produce partial or complete heart block, and "Adams-Stokes Syndrome." Lewis of London has collected a series of cases of complete heart

block in which the following pathological findings were observed: acute inflammation of the bundle of His, of rheumatic and diphtheritic origin, gumma interrupting the bundle, ulcerative endocarditis, sclerosis, fibrosis, calcification and fatty degeneration. Others have reported hemorrhage into the bundle and termed it apoplexy of the bundle of His.

The prognosis of cases of heart block is not the best, but many of them surprise us by the length of time they live in a comparatively comfortable condition. Personally, I have had three cases of heart block under my care during the last eighteen months. The case just reported died in the course of a few hours, but the history would lead us to believe that he had suffered with degeneration of the auriculo-ventricular bundle for at least two or three years; the condition probably dating back previous to the time when the pulse was noted to be below 40. One other case has an aortic stenosis and for a year or more has had heart block with dizziness and weakness; even the most moderate exercise, the least excitement, or eating a hearty meal would produce a pulse rate varying from 26 to 38 and at these times he often had what he considered dizzy or blind spells that were as a rule only momentary in duration. He always got relief by absolute rest in bed. A few weeks ago he had a rather severe attack of influenza, with the temperature going as high as 102, and since then he informs me that the pulse rate has been in the neighborhood of 70 to 80 and he is not aware of any periods of slow pulse, nor does he experience the dizziness and weakness previously noted. Whether the heart block still persists I do not know, but his present condition justifies us in expecting him to live comfortably for some time. A third case has had symptoms of heart block for about two years and at present feels about as well as he did a year ago. He has spells of dizziness on rising in the morning at times with the pulse going as low as 28.

In both of these cases fluoroscopic examination of the heart showed the rhythms of the auricle and ventricle to be independent of each other. They are taking the ordinary precautions of the cardiac patient and experience no distressing symptoms. In general, the cases which have an acute inflammation or hemorrhage into the bundle, or syphilis, give the best prospects of complete recovery. Those suffering with sclerosis, fibrosis and calcification, partially or completely destroying the bundle, usually die in a syncopal attack soon after their onset.

#### TREATMENT.

The treatment is mainly symptomatic. In my experience the condition of the gastrointestinal tract has a great influence on the

frequency and severity of the "Adams-Stokes Syndrome." Curiously enough the three cases that I have referred to in my own experience all consider their distress of gastro-intestinal origin and had been treated for this condition. Great care must be taken in keeping the bowels well evacuated and the patient should be cautioned against over-eating. In addition to this the habits of exercise should be carefully supervised, rest is exceedingly important at the onset of the trouble. When the ventricular rhythm is once established, then more freedom may be allowed. If syncopal attacks are occurring then extreme care as to exercise, emotional excitement, etc., should be taken. Anything that is apt to demand a sudden change in pulse rate should be avoided. Medicinal treatment proves of little value. Digitalis is contraindicated but in cases showing cardiac inefficiency, as well as dis-association of rhythm, small doses may be given without danger. In one of my cases strychnin seemed to be of some benefit. Hydrotherapeutic measures, carefully administered are of great value in circulatory disturbance. The two cases in which I had an opportunity to use this means experienced decided improvement in their general health and the cardiac symptoms became less aggravating. Often a decided relief would be experienced by the use of short hot applications over the liver with cold towel friction. Where the ventricular rhythm is fairly well established, then the Nauheim bath or electric Sinusoidal bath are of value.

## BIBLIOGRAPHY.

- Hirschfelder. Diseases of Heart and Aorta.  
 Lewis. Mechanism of Heart Beat.  
 MacKanzie. Diseases of the Heart.  
 Gossage. Independent Ventricular Rhythm. Heart Block and Stokes Adams Syndrome Without Affection of Conductivity. Heart, 1910, 14.  
 Fleming & Kennedy. A case of complete Heart Block in Diphtheria. Heart, 1910. II. 2.

## BIOLOGIC ADAPTATIONS, ESPECIALLY AS TO FRACTURES.\*

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Crile uses this term in a recent paper<sup>1</sup> in explaining the occurrence of post-operative gas pains, and it occurred to me at once that it would be a good title for a paper.

On a recent review, however, it appeared to me that my paper seemed quite reactionary and it may appear to you that I am advocating a new sort of Christian Science. This is the very opposite from my aim.

If the honest intelligent physician had long since kicked the placebo out of his back door

and had taken the patient into his confidence and explained to him that we are merely the hand-maids of nature, that we are merely individuals who have made a special study of the physiological and pathological processes of life and that we are therefore much better qualified to diagnose and assist nature to combat, oftentimes with force and without delay, the pathological process, we would not today be hearing our very legislators earnestly testifying to the efficacy of those doctrines born of superstition and ignorance. After all we must remember that we are very insignificant factors in the reparative and recuperative processes of life.

During the long development of the race nature has evolved biologic adaptations for every disease and every injury. Indeed this fact is the very foundation of the whole system of serum and vaccine therapy. For every disease and every infection nature has worked out its antigen, the liberation of which destroys the invading organism. Hence the natural recovery of victims of pneumonia, diphtheria, scarlet fever, measles, smallpox and, in fact all infections, although not so rapidly to some as to others, as exemplified by syphilis, carcinoma and other malignant diseases. These latter diseases are no doubt of later biologic history than the former and nature has not as yet become able to liberate the antigen in a large percentage of cases and hence natural recovery is not so well exemplified.

In such a disease as syphilis we have recently come into the possession of a chemical agent which does not itself destroy the invading organism but in some remarkable way liberates the antigen which accomplishes the destruction of the spirochaete, and there is no doubt that we will come into the possession of a similar agent which will act in a similar way on carcinoma and sarcoma. In fact, assuming carcinoma to be an infection, the remarkable influence of mesothorium and radium which probably act by liberating an antigen is indicative that we are on the threshold of a great and glorious victory over this last and most vicious of the enemies to the race. We seem already to possess an evolved immunity to carcinoma up to a certain age and to sarcoma until single or repeated traumata have inhibited or destroyed that immunity. Recently Tyzzer and Ordway have discovered that the Japanese waltzing mouse which is readily inoculable to cancer can be made immune by cross-breeding with other mice. This is the most hopeful and beautiful example of a short-cut to a biologic adaptation in the case of cancer demonstrated at any time up to the present and has given enormous impetus to the investigation of this subject.

This same principle of biologic adaptation

\* President's Address, Delta County Medical Society, Jan. 20, 1914.  
 A. M. A. Jour. Oct. 25th, 1913.



is ever at our elbow to help us in traumata. In severe contusion or puncture of the abdomen or after severe trauma of the uterus in operative obstetrics, what is the immediate result? Tympanites our horrible enemy tympanites. No, not exactly, perhaps a friend. The rapid evolution of gas in the alimentary tract is the first effort on the part of nature to limit infection by splinting the visceral to the parietal peritoneum, limiting motion and the mechanical spread of infection. It also maintains the caliber of the alimentary tract, while the peritoneum and omentum carrying hords of leucocytes, the forebears of the antigens seem to instinctively wall off the invading organism, throwing out adhesions which later become fibrous and contract. If nature wins the battle and the enemy is routed what is the result? We still have a patent alimentary tract. Under the circumstances it seems at least questionable whether the removal of all gas from the alimentary tract is a rational treatment. Why does the stomach within half an hour after lavage distend again?

Some years ago and before the introduction of proctoclysis, in one of these cases (peritonitis) I made a special endeavor to at least keep the colon free from gas. As a result I found, on post mortem, that the whole colon had contracted to a mere string fitting the caliber of the tube used. In the event of his recovery he would have had to have a new colon built in.

Now then in simple fractures, when one considers the marvelous and intricate activities of the osteoblasts and the osteoclasts, building up and tearing down and building up again the minute trabeculae of bone until they finally maintain the same pressure lines as in the original bone, one cannot without considerable trepidation deliberately lay open and insert foreign plates and grafts. We must expect the reparative elements to be enormously disorganized or inhibited at least.

Where perfect technic and little trauma have minimized the interference, nature may rally her forces and accomplish repair in spite of the foreign splints and in the case of the graft the osteoclasts eventually actually destroy it.

Therefore in simple fractures with mere solution of continuity all that is necessary is a reasonable alignment of fragments, reasonable immobility, reasonable freedom of circulation and above all, actual contact of the bone fragments.

Murphy states that non-union is enormously more frequent today than in his early years of practice and attributes this to a too perfect and too tight immobilization in plaster. When one considers the enormous reduction in the percentage of fractures, through the great number of safety devices adopted by manufac-

turers and especially by railroads, you may well imagine the import of that statement. To my mind the X-ray is responsible for the open treatment. The staggering revelations of the X-ray plate has prompted a more scientific treatment and we have lost sight of the wonderful provision for repair evolved in the course of the development of the race.

Of course, in fractures where alignment and contact is impossible, then we must use our intelligence and operate, being careful to use the most absolutely perfect technic.

In compound fractures, no lesser authorities than Lane, Martin, and Murphy, discountenance any interference whatever except surface sterilization. In fact, in the recent congress Murphy exhibited a most disreputable looking leg of which he was particularly proud. This was a compound comminuted fracture which he had merely surface sterilized and lightly immobilized in aseptic dressings. Nature had done the rest and healed his leg. This leg would have certainly been in a nearby crematory had he attempted plating or grafting in a known infected field. As it was then, he was in a position to operate and restore its function.

In fractures about joints, reductions should be within a very close range of perfection, as points of leverage and joint surfaces should be absolutely restored in order to obtain good functional results. I may state that at the recent congress in Chicago, I heard Murphy make a very revolutionary statement that we are using too much and too early passive motion on fractures about joints, thus producing an excess of fibrous tissue about the joint, resulting in a greater subsequent limitation of motion. From my past experience, I cannot see that I am going to be influenced to become a convert to this doctrine, but it shows well the present day reversion to conversatism, I might say scientific conservatism based upon a more profound knowledge of anatomy, physiology, pathology, medicine and surgery.

Under the circumstances, where nature is such a true ally, it behooves us well to hesitate before the indiscriminate use of stock vaccines and the blindfold wield of the scalpel.

#### TYPHOID PROPHYLAXIS.\*

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There is no need to tell this audience of the efficacy of typhoid prophylaxis, or, of the wonderful advance in sanitary perfectness by its use. Its value in the Texas maneuvers of three years ago is still fresh in our memories, but a brief history of its discovery and introduction into general use may be of interest.

\* Read at Medical Officers School, Lansing, Jan. 12, 1914.

It is significant to note that during the Civil War there were 80,000 cases of typhoid fever in the Northern Army alone. The Franco-Prussian War contributed 73,396 cases, and resulted in 8,789 deaths among the Germans. Sixty per cent. of the entire mortality was due to typhoid fever. During the Boer War there were 31,000 cases with 5,877 deaths. Our Spanish-American War developed 20,730 cases with 1,580 deaths among an army of 120,000 men.

Since the introduction of vaccination in the army there have been 135 cases of typhoid fever among 75,000 officers and men, and only one of these was a soldier who had been vaccinated. He received the first dose in New York and left the next day for San Francisco. The second dose was given ten days later at sea. On the 19th day after the first dose he was taken to the hospital with typhoid. Infection probably took place between the first and second dose while he was crossing the continent. The course of his disease was mild.

With this terrible scourge in mind, not only devastating homes, but rendering fighting forces inefficient, scientists in various countries were at work. To Sir Almroth E. Wright and Leishman of England, Pfeiffer and Kolle of Germany, Castellani of Italy and Vaughn and Russel of the United States Medical Corps is due the credit for convincing experiments which have made this vaccination obligatory for efficient service.

In 1897, Professor Wright of London, published a report of the first twenty anti-typhoid inoculations on human beings. In 1898, 4,000 men of the British Indian army were vaccinated. During 1898 and 1902, 400,000 doses were given to English troops engaged in the Boer war. In all 12,000 men were immunized.

Nineteen hundred eight marked the beginning of the work in our army. An educational campaign was started and many officers and men volunteered for the vaccination. With the improved technic, Major F. F. Russell made the year's work so successful that during 1909 and 1910 about 18,000 men were vaccinated. Upon the mobilization of the troops on the Texas border in 1911, the Secretary of War ordered the compulsory vaccination of all the troops in the field—the first time in the history of anti-typhoid vaccination that it had been made compulsory; the first test on a large scale of this method of individual protection against the disease which had been the terror of army camps.

In an article entitled "The Sanitary Record of the Maneuver Division," Col. J. R. Kean in charge of the Sanitary and Statistical Di-

vision of the Surgeon General's office, states as follows:

"The immense advance in camp sanitation, and particularly the value of this protective measure, can be estimated by comparing the typhoid incidence of this camp with that of the second Division, 7th Army Corps, which was organized at Jacksonville, Florida, about June 1, 1898, and remained there in camp until October, some of the regiments leaving in September. This division was not conspicuously unfortunate in its typhoid record for that time, and is selected because of the close similarity of its conditions of service to those of the Maneuver Division. The two divisions were encamped in nearly the same latitude and for about the same time; each had a good camp site and an artesian water supply of unimpeachable purity. While the period in camp of the 2nd Division, 7th Army Corps, was later in the year, the number of men involved is larger for the Maneuver Division.

The following table shows the typhoid incidence in the two camps:

Mortality and morbidity from typhoid fever in the 2nd Division, 7th Army Corps, at Jacksonville, Florida (June, October, 1898):

Mean strength .....	10,759
Cases of typhoid, certain and probable .....	2,693
Deaths from typhoid .....	258
Deaths from all diseases ...	281

Compare these figures with those for the Maneuver Division San Antonio, Texas, March 10 to July 11, 1911:

Mean strength .....	12,801
Cases of typhoid, certain and probable .....	1
Deaths from typhoid .....	0
Deaths from all diseases ....	11

"This is the more remarkable when it is stated that the average typhoid rate at the army posts in the United States during the same period was 34 per 1,000; in other words, the health of these soldiers in camp, sometimes living in deep mud and at others in clouds of dust and under a semi-tropical sun, was better than in barracks surrounded by the comforts and sanitary appliances of post life.

"There is no doubt but that the hygiene and health of the men received almost ideal care, the difficulty was, however, that the men were not confined to camp, but had liberty and opportunity to visit the neighboring cities of San Antonio and Galveston. Thousands spent more or less time in these cities, where they dined and lunched, and drank and slept; in fact, became for the time being, a part of the community.

"In Galveston, especially, where a ten minutes' ride carried one from the camp to the

heart of the city, the number of men visiting town was large. The soldier always has a good appetite, and he drank and ate everywhere—in good restaurants and bad, in the numerous lunch wagons, and at street corner stands. Fruits and pies and sweets in enormous quantities were purchased from hucksters lined up along the camp boundaries; they even invaded the company streets, carrying their various sorts of indigestible and infectious products from tent to tent. The best kind of camp sanitation could not keep down typhoid in the presence of all these possible chances of infection, if typhoid existed to any extent among the local population.

"During the period of four months there were reported to the health office 49 cases of typhoid, with 19 deaths, among the civil population of the city of San Antonio, and in Galveston 192 cases were recorded during the same period."

These two cities can therefore serve as controls and indicate what might have happened to our troops in the absence of vaccination.

"Aside from the sources of infection in the adjoining cities, we must believe that the men were also exposed to the influence of an unknown number of chronic bacillus-carriers among our own men. There is every reason to believe that among 18,000 men there were one or more carriers in each regiment, yet they spread no disease, and one of the most important conclusions to be drawn from our recent experience is that in vaccination we have the only effective protection against the elusive carrier."

Complete confidence in vaccination was established by this epoch-making achievement, and, upon the recommendation of the Surgeon-General, the Secretary of War ordered, on September 30, 1911, the compulsory vaccination of every person in the army under 45 years of age, and of all recruits. This was carried out as promptly as possible, and, as the result, the United States has today an immunized army—not a single case of typhoid having been reported among the troops in this country during 1913. This record, compared with that of any year previous to the beginning of vaccination, seems little short of miraculous.

At the Jamestown meeting of the Association of Military Surgeons, Col. W. B. Leishman of the Medical Corps of the British Army reported on the typhoid vaccination during the Boer War. The work was at that time under the direction of Sir A. E. Wright of London and Col. Leishman. Much ingenuity was used in the work which was at that time voluntary. It was arranged that of three regiments, one protected against the disease by inoculation, one in which about half the men were given the prophylactic, and another not protected

serve in the same brigade. The typhoid statistics from this organization showed a very small percentage of fever cases in the regiment where all had been protected, many more in the regiment partially protected, the largest number among those who had not been vaccinated, and the unprotected regiment was disabled for several months with a severe typhoid epidemic, among which was a large percentage of fatalities.

Up to that time the vaccine was given at a single dose, which produced quite a brisk reaction. The difference of manufacture of the vaccine, too, is important in that living germs were injected.

Over thirty years ago, Eberth discovered the cause of typhoid fever, a bacillus, which when present in the body changed the blood and built up within it a certain protective substance which is present in the blood long after the patient has been cured of typhoid fever.

Protective substances which are developed in the human organism after anti-typhoid inoculation are identical with those developed in the course of an attack of typhoid fever. This observation first proven on animals showed that animals can be rendered resistant to the fever by the same process of inoculation as that which we now use in the human being.

The immunity induced by anti-typhoid vaccination is a bactericidal immunity, due to an increased power of the individual to kill the typhoid bacteria by its body fluids, which increased power is again due to an increase in the specific anti-body or immune body in the blood. The body also after vaccination acquires a habit of producing these protective substances on a stimulus of much slighter nature than before the inoculation.

#### MODE OF ADMINISTRATION.

The vaccine used is prepared by taking some of the typhoid fever bacilli from a patient who has the disease and in growing it in the laboratory in enormous quantities, and diluting it so that each  $7\frac{1}{2}$  drops contains 500,000,000 bacteria. These are killed by heating to 60 degrees Centigrade. All vaccine is first tested on white mice and rabbits and carefully examined for the exclusion of any other germ before it is used on a human being. This method of administration may not be familiar to all of you.

The first dose is  $7\frac{1}{2}$  drops, the second and third are 15 drops; an interval of ten days being allowed between doses, the entire course thus requiring twenty days. An interval of ten days between doses has been adopted because experience shows that the production of large quantities of specific antibodies does not become evident until about eight to ten days after administration. The second dose is



therefore not given until the first has become effective, since there may be a temporary fall in the quantity of protective bodies present in the serum after the administration of the second and third doses. It is not believed that there is any increased susceptibility to typhoid fever following the first dose. On the contrary it is thought that increased resistance begins immediately, although the degree of immunity produced is not very high until after the lapse of ten days.

If it is not convenient to give the second dose at the regular time it may be hastened a day or two or be postponed up to the fourteenth day, but good results cannot be counted upon after a longer period of time. The site of the inoculation is the arm at the insertion of the deltoid muscle in the upper arm. The dose is to be given under the skin, not into the muscles. The arm is cleansed as for any other operation. The use of tincture of iodine diluted with alcohol has proved satisfactory as a skin disinfectant. The dry skin is painted with iodine before and after the hypodermic injection.

No person should be immunized who is not perfectly healthy and free from fever at the time. In case of doubt it is advisable to take the temperature and to examine the urine. If the man has fever or any other signs of illness, the prophylaxis should be postponed until he recovers. This precaution is necessary to avoid its administration to men who may be coming down with typhoid or other fevers. No alcoholic beverage in any form should be used on the day of treatment.

The vaccine is borne well by children and by women; use doses proportionate to the body weight. The most suitable time for the administration of the prophylactic is about 4 o'clock in the afternoon, as the greater part of the reaction is then over before morning. There is usually some headache and indisposition and a local reaction consisting of a red and tender area about the size of the palm of the hand and sometimes tenderness in the axillary glands under the arm. The entire reaction is over in forty-eight hours. It is best not to require any duty for that period and not to permit active exercise such as long rides or walks.

Some individuals may be very susceptible and develop a marked general reaction (headache, backache, nausea, vomiting, etc.) and some loss of body weight. The number of such reactions is exceedingly small, and, regardless of their severity, they all as a rule disappear completely inside of forty-eight hours. The Widal reaction is always positive after typhoid prophylaxis, it appears in about ten days after the first dose and remains positive for six months to a year.

At the present time boards of health, school trustees, contractors having gangs of laborers on railroads or public utility projects, mining camp operators, are considering the inoculation of their men to get the lowest sick report, which spells the highest efficiency for them. This fall a serious outbreak of fever in New York City has raised the question of school vaccination.

The Health Commissioner of New York is a strong advocate of vaccination as a preventive of typhoid fever, but he doubts if compulsory vaccination of all school children is feasible now. Remembering the opposition to smallpox vaccination, all of which has not yet disappeared, he said he believed the protest against a law requiring school children to be vaccinated for typhoid as well as for smallpox would be great.

Dr. Mark L. Fleming, the acting superintendent of Bellevue Hospital, where the present outbreak is, believes compulsory vaccination for typhoid fever will ultimately bring about the elimination of the disease.

He is very much in favor of immunization: "We require all nurses and doctors to be vaccinated before they enter upon their duties. We do it for their protection, and the system has worked out well. If all school children were vaccinated, the elimination of the disease ultimately would follow, as it has in the case of smallpox."

Typhoid is an unknown disease at Governor's Island, and this health commissioner believes it is due to the constant requirement of typhoid vaccination among all new arrivals.

The first typhoid vaccination for the National Guard of Michigan owes its inception to a line officer—Major Earl R. Stewart, who issued the necessary orders for voluntary submission to the treatment to members of the Grand Rapids Battalion. The difficulties of getting a command inoculated at their home station was conclusively shown. In many instances parent's consent was necessary, and the fact that the second and third doses could not be given all on the company drill night, made it necessary for the guardsmen to give up another evening. Many took one or two inoculations and forgot the third. However, the educational effect on the entire command was of value, and about fifty per cent have been vaccinated. Members of the Detroit, Kalamazoo and Flint organizations have also had the treatment.

Early in the Copper Country service, the commanding officer issued an order to the effect that every member of the command should be vaccinated, and it is interesting to note that although typhoid fever was present in many of the locations where troops were quartered, no case of fever has developed from that service.

# TRANSACTIONS

OF THE

## Clinical Society of the University of Michigan

Stated Meeting, January 3, 1914

The President, R. BISHOP CANFIELD, M.D., in the Chair

Reported by REUBEN PETERSON, M.D., Secretary

### *Reading of Papers*

#### SUBPERICHONDRIAL HEMILARYNGECTOMY IN SQUAMOUS CELL CARCINOMA OF THE LARYNX.

R BISHOP CANFIELD, M.D.

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The extralaryngeal operation for the removal of laryngeal cancer, whatever the technic used has always resulted in the complete loss of the function of the larynx. The operation includes the removal of the larynx either partially or totally, turning the proximal end of the trachea forwards and suturing it to the skin, closing the communication between the pharynx and operative field and finally closing the neck wound either at the time of operation or later. This means that, for the rest of the patient's life, breathing must be accomplished through the neck, while the best voice that can be secured is an explosive whisper brought about by the sudden forcing outwards of the air contained in the mouth.

The purpose of this brief preliminary report is to suggest a method by which, it is hoped, in a certain number of selected cases of intrinsic laryngeal cancer, not only a satisfactory voice may be preserved, but also that breathing may be accomplished through the mouth. I have given to this method the name of subperichondrial laryngectomy. In brief, the technic includes a preliminary tracheotomy, incision of the perichondrium covering the thyroid cartilage and the subperichondrial enucleation of the thyroid cartilage together with the cancer.

This procedure leaves the space previously occupied by the larynx lined by perichondrium. After a partial laryngectomy the surface above

and beneath this space will be covered by mucous membrane from the contiguous surfaces, while after a complete laryngectomy it will be necessary to cover this area with skin or mucous membrane grafts. The object to be secured is the patency of the tract from the buccal cavity to the upper end of the trachea. I am sure that this can be secured after a partial laryngectomy and am optimistic about it being possible after a complete laryngectomy, although in the latter case it may be necessary for the patient to wear a special intubation tube. The advantage claimed for the preservation of the perichondrium is that it assists in maintaining the patency of the tube and affords a surface over which epidermatization takes place readily.

CASE 1. Mr. H. R. M. age 69. The patient presents himself on account of a hoarseness which has been slowly increasing for about a year and a half.

*Examination:* The right vocal cord from the anterior commissure to the vocal process and the right false cord throughout a corresponding area is involved in a neoplastic process. The mass is rough on the surface and shows loss of epithelium over the anterior half. The posterior half is apparently covered by mucous membrane. The mass is pale, irregular in outline, covered with mucus and apparently infiltrates the neighboring tissues. Both arytenoids show moderate edema around their bases. Although the mass extends quite to the anterior commissure, the left half of the larynx shows no involvement when seen from above.

*Operation, Dec. 27, 1913:* Suspension laryngoscopy and removal of a specimen: at the time of the removal of the specimen, the base of the mass was found to be hard, rough and difficult to remove. A specimen was removed from the tumor, one from each arytenoid area and one from the left false cord.

*Pathologic report:* Specimen from the

tumor shows squamous cell carcinoma; other specimens negative.

*General Examination:* Chest negative except for moderate emphysema. Urine: Heavy reaction for reducing substance, moderate acetone.

In view of the fact that involvement of the left half of the larynx could not be demonstrated, a hemilaryngectomy was decided upon. Following a three day VanNoorden diet the patient became sugar free.

*Operation, Jan. 1, 1914:* Operation under novocain one per cent. anesthesia. (1% in 1-10,000 adrenalin). Median incision from hyoid bone to sternum, resection of the thyroid isthmus and preparation for low tracheotomy. Incision of the perichondrium over the anterior edge of the right thyroid cartilage. Separation of the perichondrium from the right thyroid cartilage. Tracheotomy. Incision of the cricothyroid membrane. Attempt to split the thyroid cartilage found impossible with scissors on account of the calcification of the cartilage. Thyroid cartilage finally split with Asche forceps. Separation of the two halves of the thyroid cartilage showed the tumor to be about the size of the first phalanx of the little finger. The left half of the larynx was seen to be apparently healthy. The cricothyroid and thyrohyoid membranes were then incised along the lower and upper edges of the thyroid cartilage. The greater wing of the thyroid cartilage was severed and the thyroid cartilage; the mucous membrane of the right half of the larynx and the tumor were removed in one piece. Two or three vessels were then ligated and the larynx packed with gauze. Two sutures were then passed through the perichondrium of the two sides but were not tied. Three sutures were used to unite skin edges. The operation was painless and without hemorrhage.

*Post Operative Course, Jan. 11, 1914:* For four days the patient enjoyed a satisfactory convalescence. Locally the condition was perfect. The wound did not become infected and but little mucus collected in it. With the edges of the incision held in coaptation a surprisingly good voice was secured. On the morning of the fifth day slight evidence of a pneumonic process was discovered over both bases behind. This process advanced with the tremendous rapidity sometimes seen in the terminal pneumonia of the aged and terminated in a few hours.

*Autopsy:* Moderate involvement of both lungs, fatty heart. Neck and bronchi negative.

#### DISCUSSION.

DR. C. B. DE NANCREDE: It has been extremely interesting to me, to hear this paper, because Dr. Canfield had the same experience in dealing with

the thyroid cartilage that I had some thirty or more years ago, while operating for an intralaryngeal growth. The forceps would not divide the structure properly and I think I had to employ a Hey's saw. I think he is to be congratulated on having got so good a result, by infiltration analgesia, and I am very sorry my prognosis expressed the other day has been somewhat verified, I mean the chances of failure in diabetic cases.

## NERVOUS CHILDREN.

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The title "Nervous Children" was chosen because we are not altogether justified in speaking of neurasthenia and hysteria as fully developed entities in the early years of life, as we observe them in the adult. The child presents only certain phases of these definite forms of disorders as they occur in the adult. This is self-evident from the fact that in the tender years of life we are dealing with an undeveloped psychic sphere. While certain characteristic symptoms of these disorders occur quite early in life we can not expect to find in a developing organism the symptom complex which characterizes certain definite forms of nervous disease in a fully developed psychic individuality.

The organic diseases of the brain and the spinal cord and the psychoses of childhood, also the hereditary psychopathic states, and the various forms of mental deficiency cannot be classed under the head of nervousness. As is well known, there are certain anatomic peculiarities of the nervous system of the child which necessarily give rise to physiologic and psychologic characteristics. The child's brain presents an undeveloped fiber system; many of the ganglion cells of the newborn are not of the fully developed type and show some of the embryonal character. Retrogressive changes in the nervous elements of the fully developed brain present clinical features which are not unlike the psyche of the child. In consequence we may accept, in part at least, the fiber and cell development as the basis of the child's psychic development.

While one is able to establish certain more or less definite stages in the psychic development of the child, there are great individual variations which come within the normal limits. In the beginning, the manifestations which constitute life in the newborn are wholly expressions of the subcortical function. In other words, all activities are accomplished without conscious impressions and are, therefore, reflex in character. Gradually from the simplest reflex manifestations the activities become more complicated and finally invade the cortical, motor and sensory spheres. When



the child begins to differentiate between objects held before it and with its own arm reaches out and grasps the chosen one, we are certain that the motor cortex is active and that there are conscious impressions. It appears that a certain equilibrium is established first before any marked consciousness enters into these actions. So it is with the speech, at first a mechanical jargon, which gradually becomes intelligible speech in which the higher cortical centers play a part. The child learns to walk at the age of one or one and one-half years without the aid of a fully developed active consciousness.

In the development of affectivity, at first most primitive, is the differentiation between likes and dislikes but as the intellectual development progresses this differentiation becomes more and more apparent through the various emotional manifestations (joy, grief, sexual emotion). The associations, that is, the power to think, are extremely simple and few. They are simple analogues, that is, the child will call every woman mamma and every man papa. It is very evident that only the most primitive analogous conclusions are possible. As the vocabulary is more enriched (according to Ziehen at one and a half years about forty words, at the end of the second year over two hundred to three hundred words), the ability for more extensive associations is increased. In the normal child the separate psychic qualities are, as a rule, comparatively uniform in their development. There exists a certain harmony in the psychic development of the normal child. However, there may be pauses in the mental development which, to be sure, are of short duration, one or more weeks, very rarely months. During these periods stimulations bring no reactions and urging is of no avail, the progress in mental development returns spontaneously. It is, therefore, not necessary to urge the normal child in its mental exercises and in the psychopathic child such urging is decidedly harmful. Careful observations will reveal that the child possesses a marked imitative impulse, an important factor in the rearing of children and in the development of pathologic tendencies. It is responsible for much that is frequently attributed to heredity. In fact, hereditary influence counts for little when we determine by careful analysis the origin of the elements that form an individuality with the normal child or the anomalies in the abnormal.

The apparent independent judgment of the child in most cases is but a representation of a figurative association complex which is quite evident in the first years of school instruction where there is a tendency to make a strong impression upon the child's mind of definite formulated rules and fixed conclusions. The

child is therefore unable to give reasons for these conclusions, the result of independent thought. Of course the effort is also made to stimulate the child to draw its own conclusions and to formulate independent judgment. This is with some children successful within a limited field, but never in general. The child who makes wonderful progress in a special field, as in mathematics or languages and fails in less complicated branches is not infrequently of a psychopathic disposition and the unusual attainment, a psychopathic symptom; this is of importance in connection with the development of certain anomalies.

The child does not appreciate the significance of its own existence, its personality, its relation to the outside world. This is evident from the fact that the child speaks of itself in the third person until the third year. Even then recognition of personality is manifest in a very primitive manner in that the child no longer speaks of itself in the third person, that is, instead of saying "William wishes to have" it says for the first time "I wish to have." We are, therefore, unable to recognize personality in the child before the end of the third or fourth year, much less anomalies of personality before this period. It stands to reason, therefore, that a nervous disorder of personality cannot appear before this time. In a general way the impressions through the sense organs are after this time more fully appreciated and the correct interpretation of the more simple ones is evident of a wider association becoming more and more complicated as time goes on, until the highest psychic function is attained, when we may speak of the child's intelligence.

In the earlier months of life the child is less susceptible to stimulation. Not only is this true in the motor sphere but frequently stimulation of the sensory nerves is not perceptible to the newborn. There are a number of neurologic conditions peculiar to childhood. The tendon reflexes are more active than in the normal adult from the second month to the second year. The umbilical reflex which is frequently absent during the first weeks is later very marked. Not infrequently we can obtain the Babinski toe reflex in the second half of the first year. The conjunctival reflex is present at the time of birth. On the other hand, the blinking of the eyes is often not present until the sixth or eighth week. The pupillary light reflex is present from the time of birth, while the pupils do not react in accommodation until about the fourth week. The photophobia, present at birth, usually disappears within ten to twenty days. Fixing of objects within the line of vision occurs in the fourth or fifth week, but following the objects with the eyes is not observed until the

third or fourth month. The newborn is deaf and the function of hearing is gradually established until at the end of the third month there is fairly good hearing.

There are certain peculiarities of childhood under normal conditions which are of interest in the study of abnormal states. In the fifth, sixth, seventh and eighth year the child develops an extraordinary interest in its surroundings and asks numerous questions. This is not an expression of a series of association complexes but is more or less mechanical, so that a number of questions pertaining to objects closely related to each other follow in succession in a rhythmic manner. In the emotional sphere there is little control in early childhood and a more or less marked impulsiveness is always apparent. Ideas presenting themselves are executed without consideration or control. Very early the child is able to distinguish and appreciate the difference between agreeable and disagreeable situations and unsightly objects when this requires no great amount of intelligence. Herein lies the secret of discipline as it is ordinarily applied to children. The child does not consider its act from an ethical standpoint, but associates the act with the situation that follows, be it praise or punishment, and here again comes into play the strong imitative impulse of childhood. The disposition of the parent and the situation created by the parent in the discipline of children are largely responsible for the disposition of the child. The proper punishment applied at the proper time will develop a substantial control in all of the child's acts, while praise has a tendency to increase the natural impulsiveness. Many of the anomalies of disposition and symptoms of nervousness are the result of mistakes in discipline in early childhood. It is of interest to note the well marked imaginative power of the child. It not infrequently mingles the imaginary with the real, which is evident in the susceptibility to fairy tales and phantastic portrayal. The memory of the child is in some respects peculiar. While the child generally has a quick conception, there is a tendency to forget on account of the lack of proper association. Nevertheless the psychic impressions of childhood are permanent, although apparently unconscious, and are therefore not memory in the ordinary sense. Most of the associations that can be reproduced under certain definite stimuli are those of childhood impressions. Observations and experiences have a permanent place in the unconscious mind, and if of a painful character they again may be reproduced in a distorted form as nervous symptoms.

#### ETIOLOGY.

In the majority of nervous children one is able to demonstrate a certain endogenous pre-

disposition, the so-called psychopathic or neuropathic disposition. But in studying the personality of the father, or the mother and perhaps the several other children of the family, as well as the general environment of the child, the endogenous predisposition does not appear so prominent as a causative factor of nervousness. Many times the neuropathic disposition is an acquired complex of nervous manifestations, the result of environment. However this may be, it is true that the resistance of children to outside influences at the time of birth is just as variable as their external appearance. One child becomes easily nervous, another less so, a third under the most careful regulations is predestined to be a nervous child. Among the avoidable exogenous causes of nervous children are the mistakes of early training, involving the personality and situations created by those having this responsibility, in which the physician is frequently a prominent figure.

Faulty training of children begins immediately after birth. A child in the first days, weeks and months of life requires a great deal of sleep, in the first week at least twenty hours in the twenty-four and for months after sixteen hours. There are many conditions too numerous to mention here that prevent this, even in the best regulated homes, but all of them avoidable. At this time these outward influences are only reflex, since, as already mentioned, there are no psychic impressions at this period of life. Later the usual method of amusing the child is unquestionably harmful. The small child should be lonesome and not subjected to the stimulations arising from the implements we choose to call toys.

The over stimulated child, the unusual child or the wonderful child frequently is a nervous child. It is often pathetic to hear the mother boast that her child can read at three or four years or can produce melodies after hearing them for the first time. Such children are frequently more or less exhausted by the time they reach the school age and are not equal to the demands made upon their neural resources. When the problems of the school curriculum become more difficult, there appear periods of exhaustion, irritability, disturbed sleep, et cetera.

Corporal punishment in childhood is a barbaric method of training. It is no longer permissible in punishing criminals, why should it be tolerated in the training of children? The normal child may survive with an amiable disposition, while that of the nervous child is surely not improved by such treatment.

The desire for freedom is an early manifestation in the child's emotional sphere and any forced restrictions will invariably produce re-

actions of resentment. When it is necessary to apply force there is always an error of training or in the disposition of the parent. It is therefore unnatural and unfavorable for the physiologic development of the child to be surrounded by and compelled to follow severe regulations in the home or in the school. An equilibrium can be established only by carefully observing the reactions of the individual.

Of the greatest importance in this connection are the physical and psychic trauma which not infrequently arise as a result of this form of applied force. The effect of a physical trauma and also of the psychic, to a certain extent, is the same as in the adult, resulting in a pathologic reaction in any psychopathologic individual. The majority of cases of hysteria in adult life have their origin in this period and from this cause.

In grouping nervous conditions of childhood the writer has chosen the plan of Cramer<sup>1</sup>, who collects the symptoms under four heads as follows: neurasthenia, endogenous nervousness, complicated endogenous nervousness, and hysteria.

#### NEURASTHENIA.

In childhood, as in the adult, there is an exhaustion of the cortical nerve centers which occurs in children who are not necessarily of a neuropathic disposition, and is the result of strenuous mental effort without sufficient time for recuperation in rest and sleep, and which results in a chronic exhaustion of the brain centers. This type of disturbance undoubtedly forms the smallest number of nervous children. In two hundred cases of nervousness observed by the writer, there were but nineteen that could be thus classified.

#### ENDOGENOUS NERVOUSNESS.

This is a nervous exhaustion in a child with a marked neuropathic disposition and follows a moderate mental exertion in one who has the requisite amount of rest and sleep for a normal child. In other words, it has to do with a child with diminished resistance who has not the endurance of the normal child under normal conditions. This class was represented by twenty-eight in two hundred cases, the ages of the patients ranging from six to thirteen.

#### COMPLICATED ENDOGENOUS NERVOUSNESS.

This form of nervous affection is due to physical ailments in predisposed children. In this class belong the intensely nervous, sensitive, excitable, irritable, restless child ever prone to habit spasms, nocturnal incontinence, et cetera, yet who may show no actual evidence of nerve exhaustion. Among the more com-

mon causes are enlarged tonsils and adenoids, eye defects, diseases of the skin, disorders of digestion, constipation and incipient tuberculosis. In the writer's series there were ninety-three belonging to this class.

#### HYSTERIA.

Here the child presents a marked neuropathic disposition which is most evident in hypersuggestibility, increased imaginative power and inclination to lability and emotionalism. The physical stigmata are apparently not so numerous in childhood as in the adult. Anesthetic conjunctivae are frequently met with, as well as areas of anesthesia and hyperesthesia. When these are demonstrated they are sharply circumscribed and usually located on the back, thorax and abdomen. Seventy of the two hundred cases recorded were classified as hysteria, the ages of the patients ranging between four and fourteen years. Fifty-eight of these patients were girls.

The physical expression of hysteria in childhood is monosymptomatic, at least one symptom is so apparent in the patient that it overshadows all other manifestations. It is very rare that a more or less complete symptom complex is observed in children before the age of ten. Sensory and motor anomalies are about equally divided, the psychic manifestations being always present. The cases under analysis presented a great variety of psychic anomalies, some of which I will briefly mention: A patient with a perverse paradox mental reaction was repeatedly overcome by fear which was followed by nausea and vomiting whenever she saw a certain shade of red, the result of a previous experience in suddenly coming upon a bleeding animal while out walking. Dislikes for certain odors and tastes ordinarily pleasing to the normal child were observed in several patients with somewhat similar explanations. Fears and timidity resulting from sudden visual and aural stimuli were noted in a number of cases. There was an acute hallucinatory delirium in a child of ten years suffering from hysteria which lasted from one-half to two hours and was the result of a sexual trauma at the age of seven years. A child who repeatedly ran away from home was severely punished by the mother and gradually developed an atasia-abasia. In this case the act of running away was based on a feeling of compulsion to do so. Compulsory ideas and phobias of various kinds were elicited from children six and seven years old. Idiosyncrasies which had their origin in superstition, and strong aversion for certain foods based upon an unpleasant personal experience were met with repeatedly. The suggestion of a resemblance between one child and an insane aunt caused the patient to be ob-

1. Handbuch der Nervenkrankheiten im Kindesalter. Berlin. 1912.



sessed with the idea that she would be insane at the age of twenty-five, the exact age of the aunt.

These few examples illustrate the influence of personality, environment and careless suggestion in the development of hysteria in childhood. Out of two hundred cases of hysteria in the adult I was able to collect one hundred and seventy-three cases that had their origin in a psychic trauma occurring between the ages of four and ten years. In ninety per cent. of the cases I was able to show a neuropathic disposition in one or both parents. In two hundred cases of adult neurasthenia between the ages of eighteen and forty-five years, there were but twelve per cent that gave a history of nervousness in childhood. In forty-two per cent. of all cases I was able to trace a neuropathic disposition in one or both parents. In all of the twelve per cent there was a history of nervousness in the parents.

#### CONCLUSIONS.

The conclusions one may draw from the analysis of the two hundred cases of nervous children are, that neurasthenia, pure and simple, is not frequent in the earlier periods of childhood. It is not as a rule hereditary and neurasthenia of adult life is not a persistence of childhood neurasthenia. The most common causative factor in childhood is mental overwork without the requisite periods of rest owing to the patient's surroundings.

In cases of endogenous uncomplicated nervousness, a marked neuropathic disposition is prevalent and no doubt is the hereditarily weak child which has diminished resistance and is unable to cope with the more strenuous mental life. This form is not observed until the school age is reached and continues in adult life to form the group known as nervous men and women, and possibly may also include the cases grouped under psychasthenia. Complicated endogenous nervousness is observed much earlier in the child, the youngest in the series being one year old. It is the most frequent form of nervousness in childhood and shows the importance of physical disease in the production of nervous disorders.

Hysteria in the adult is a persistence of the disease in childhood in the majority of cases. The disease itself is not hereditary but may to a certain extent be dependent upon a predisposition, either acquired or hereditary.

#### DISCUSSION.

DR. C. D. CAMP: I have been very much interested in Dr. Klingmann's paper, although I must confess that I am interested in the subject somewhat as an amateur. It is my impression that we should make a careful distinction between nervous diseases in children and "nervousness in childhood." My experience has been that nervous diseases in childhood present about the same problems as do

nervous diseases in adults. We have all of the organic diseases in childhood that we have in adults, or practically all. We have cases of paresis, for instance, which are practically the same as paresis in the adult, and we certainly have cases of hysteria and neurasthenia in childhood which differ very little from those diseases in adults. On the other hand, "nervousness in childhood" has always seemed to me to be due to some condition outside the nervous system. Whenever I see simply a nervous child, an irritable, restless, disobedient child, I consider it certain that there is some cause outside the nervous system; some trouble with the eyes or the teeth, the nose and throat, or some other part of the body.

DR. D. M. COWIE: I am very glad to have listened to Dr. Klingmann's paper. The subject of course, is of very great interest to all physicians, particularly those who are engaged in general practice. My personal opinion about the cause of the numerous manifestations of nervousness in children is that they are due in a great part to environment. Attention has been called to what I believe to be a very pernicious habit, that of amusing children. Children should not be brought up with the idea that they must be amused all the time. It is surprising how little care normal infants and children require in order to keep them happy. If they are kept clean, warm, dry and properly fed, they will amuse themselves with very few playthings. A child should be allowed to grow like a plant. All it needs is a little cultivation. When it reaches the age of six months it will sit up and will insist on doing so if it is a normal baby. When it is a year old it will make efforts at locomotion, all without any help. The child has an equal capacity to amuse itself. The infant should be allowed to develop itself. Leaving a baby or an older child entirely to its own devices on the other hand is equally pernicious in its effects. Extremes must be avoided. It is wrong to let a child lie all day in the same bed. Infants treated in this way frequently make slow development and do not manifest the same intelligence that children do who are taken up occasionally and moved from one part of the house to another, and thus given a change of position as well as of scene.

### THE INJECTION OF ALCOHOL INTO THE GASSERIAN GANGLION IN THE TREATMENT OF TRI- FACIAL NEURALGIA.

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The most scientific as well as the most satisfactory treatment for trifacial neuralgia is the removal of the cause. In 1909, I published a paper (*The Cause and Treatment of the Trifacial Neuralgia*<sup>1</sup>) in which I dwelt at length on this point. In some cases, in spite of diligent search the cause is undiscovered; these are usually in patients well advanced in years and it is to the treatment of this class of case that I would especially call attention. Electricity may be of some benefit to them, but I have never seen one cured that way. Medical

1. *Physician and Surgeon*, August, 1909.

treatment is not curative unless directed towards the cause—that is, quinine in malarial cases, iron in anemia, et cetera. The injection of alcohol, osmic acid or other substances into the nerve, either deeply or peripherally, is usually a measure affording temporary relief only; the nerve almost always regenerates and the pain returns. The removal of the Gasserian ganglion, surgically, is usually curative but the operation is a very difficult and dangerous one; the best surgeons often hesitate to attempt it and if the patient survives the operation there is great danger of trophic ulcer of the cornea and also danger of cerebral hernia.

It is generally conceded that, in order to prevent recurrence of pain, the ganglion must be destroyed and, in 1909, Harris suggested that this might be done by passing a needle through the foramen ovale and injecting alcohol into the ganglion. In 1912, he published three cases which he had treated this way, though Offerhouse and others had treated the suggestion as quite impossible. Hartel, in Germany, also injected the ganglion but with a somewhat different technic. Taptas, in France, used the same method as Harris.

I became interested at once on seeing the paper by Harris and, after some practice in the anatomical laboratory, injected my first case, April 19, 1912. The patient was fifty-six years old and had had neuralgia for fourteen years. He had been extensively treated and had an operation on the nerve with temporary relief. After the injection it was noted that there was analgesia in the distribution of all three branches of the nerve and he had no attacks. He was discharged from my service in the Hospital six days later and I have heard that his neuralgia is cured but have had no opportunity to re-examine him.

The second patient was a woman, age forty-six, with severe trifacial neuralgia of two years' duration. She was admitted to the Hospital in December, 1912, and on January 6, 1913, had an injection of alcohol into the peripheral nerves at their exit points on the face, with complete relief. On Feb. 17, the patient came back to the Hospital, the pain having returned two days before. The Gasserian ganglion was injected, Harris method, on February 24, 1913. In less than ten minutes after the injection there was complete analgesia of the right side of the face in the distribution of all three branches of the fifth nerve, and the right side of the tongue. The corneal reflex was lost on that side. Sensation to pressure was preserved. On February 27, it was noted that she had a vesicular eruption about the right corner of the mouth resembling herpes zoster. On March 2, she had no pain and the area of analgesia was the same as before. A steel pin

was thrust through the right side of the tongue without causing pain, though the patient said that she felt it going through. The corneal reflex was lost but there was no keratitis. An examination made December 11, 1913, showed the area of analgesia slightly less extensive but otherwise the same as at the previous examinations.

The third patient was a farmer, aged sixty-eight years, with typical and very severe neuralgia in the left side of the face, duration four years. His blood pressure was 200 mm. Hg. but, except for the manifestation of the neuralgia, his neurologic and physic examination was negative. He was given an injection of 1 c.c. of 1 per cent cocaine in 80 per cent alcohol into the Gasserian ganglion, July 24, 1913. Analgesia of the left side of the face was complete inside of a few minutes. After the withdrawal of the needle he said that he felt dizzy and nauseated and there was noticed a weakness in the muscles of expression on the left side of the face and a paralysis of the left external rectus muscle but this paralysis was transient and there was no trace of it the following day. There remained a permanent analgesia of the left half of the face in the distribution of the fifth cranial nerve (Figure 1),

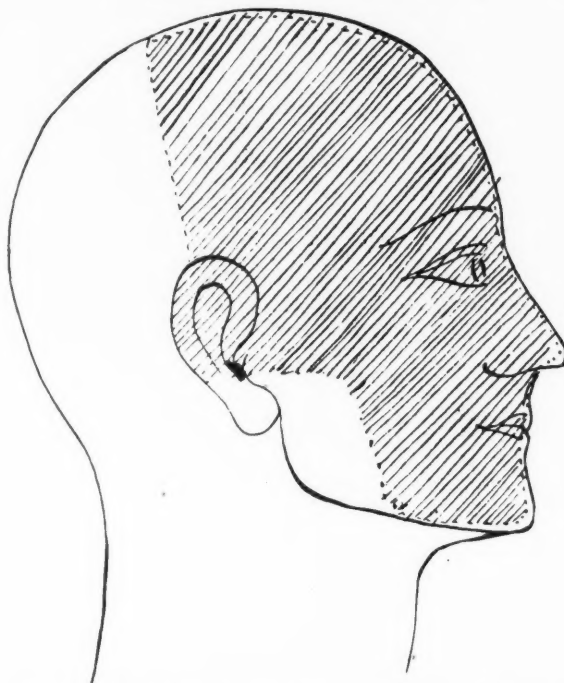


Fig. 1. Shaded area of the face in analgesic to pinpoint. Case III, Jan. 13, 1914.

also analgesia of the left half of the tongue, and of the mouth as far back as the middle of the tonsil. The left cornea was anesthetic and the reflex abolished. It was also noted that the temporal and masseter muscles on the left side did not contract on mastication. Some interesting physiologic studies have been made on this patient relative to the functions

of the Gasserian ganglion. Dr. Canfield reported that the tympanic membrane was anesthetic, the only response to the probe being a ringing tinnitus.

The patient's present condition can be shown you, for he has very kindly returned to the Hospital at my request for re-examination. He has had no pain since the injection and feels very well. The extent of the analgesic area is about the same as on previous examinations and the corneal reflex is still absent. There is no sign of keratitis.

Using aseptic precautions the needle is inserted through the skin opposite the lowest part of the sigmoid notch and pushed upward and

through the foramen spinosum, the cavernous sinus, et cetera, and injury to them would probably have serious consequences but no case has yet been recorded in which there has been a serious accident when using the Harris technic.

I feel safe in saying that the demonstrated possibility of destroying the ganglion by simply injecting alcohol into it, without opening the skull, is a great step forward in the treatment of intractable cases of tic douloureux but it should only be done after every effort to find or remove the cause has failed and the peripheral injections or operations do not give relief.



Fig. 2. Lateral view of the skull showing the relation of the needle to the bones of the face and skull.

backward to the foramen ovale; after recognizing this point the needle is pushed not over one centimeter through the foramen and the alcohol injected. (Figure 2.) The position of the needle is shown in the illustration. (Figure 3.) The appearance of the analgesia in the forehead is an indication that the ganglion has been reached for the ophthalmic division of the fifth, of which the supraorbital is a branch, passes directly into the orbit and the alcohol would not influence it unless the needle had passed through the foramen ovale.

The insertion of the needle is not without some danger for important structures are very close; the middle meningeal artery, passing

#### DISCUSSION

DR. C. G. DE NANCREDE: I agree entirely with Dr. Camp concerning the seriousness and difficulty attending the Hartley-Krause operation. I need not dilate further upon the dangers of this method which sometimes necessitates operating in two or three stages because of the free hemorrhage which obscures the field of operation, and is sometimes dangerous to life. The anatomic differences in this particular part of the cranial vault are liable to relatively great variability, and I do not see how in certain cases one can surely avoid injuring large bloodvessels. Sooner or later, those who employ this method will surely meet with such accidents. I think that it is far better before undertaking the injection or excision of the ganglion, to employ more conservative measures such as the injection or



removal of the peripheral branches. I have frequently seen bad cases of trifacial neuralgia given very prompt relief, for relatively long periods, from conservative methods such as these. I do not think Dr. Camp has done justice to the efficiency of these methods. Furthermore, a change in climate will often effect a distinct relief where advanced arteriosclerosis is present avoiding marked changes in atmospheric pressure which causes circulatory changes in the ganglion or its branches. I think that all the conservative and less radical methods

lion. Certainly the cases I have seen of his have been perfect in their results and with no ill effect so far as I could see. I agree with Dr. de Nancrède that it is better to have the peripheral causes removed first, but I should certainly prefer having my ganglion injected to having it removed.

DR. CAMP (closing the discussion): I have been very much interested in Dr. de Nancrède's experiences. As I said at the beginning of my paper, it is certainly more scientific to remove the cause, if it can be found. As a matter of fact, it is remark-

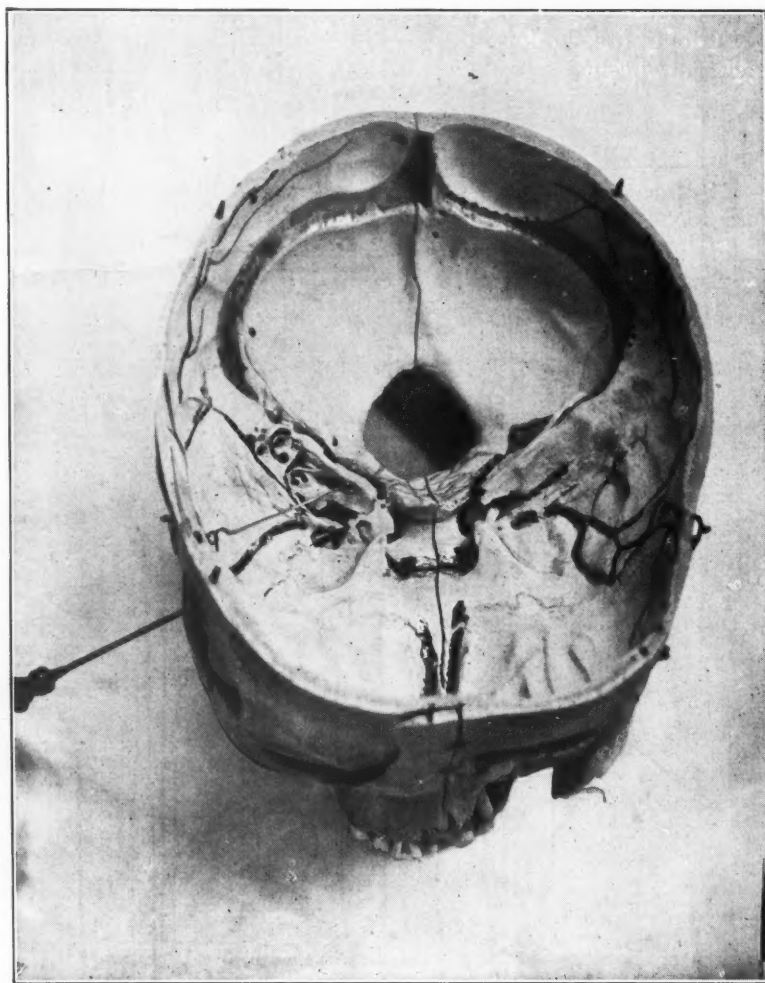


Fig. 3. View of the base of the skull from above.  
The needle is in about the position of the Gasserian ganglion.

should be tried before considering either injection or removal of the ganglion.

I do not say Dr. Camp's operation is impossible, for he has succeeded, and I recently referred a private case to him for this operation, but I do say that I am perfectly sure if injection operations be tried often enough, serious accidents will occur.

DR. R. BISHOP CANFIELD: I can vouch for the success of Dr. Camp's injection in the cases I have seen. I would not like to turn over to him my cases of internal pressure, but given a case where there is no question of peripheral irritation, I can see a distinct place for the injection of the gang-

lion. I am sure how many cases one can cure that way if one is sufficiently patient and diligent. I have had about forty cases of trifacial neuralgia in the past two years and only three have needed this injection. Dr. de Nancrède has had to operate on the Gasserian ganglion and has made a strong showing as to the dangers and difficulties involved in this operation. It is true that one would prefer to do peripheral injections but recurrences are frequent. One of the patients reported this evening had had several peripheral injections and two peripheral operations in which a large part of the superior maxillary had been cut away, and then there was a recurrence.

- (1) A CASE OF OBSTRUCTION OF THE CENTRAL RETINAL VEIN.
- (2) A CASE OF OBSTRUCTION OF THE OPHTHALMIC VEIN.
- (3) A CASE OF HEMORRHAGE AT THE BASE OF THE BRAIN WITH PRESSURE SYMPTOMS RESULTING IN IMPEDED VENOUS FLOW, PARALYSIS OF EXTRINSIC MUSCLES AND PARTIAL DEAFNESS.

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CASE I. A case of obstruction of the central retinal vein, possibly due to proliferation of the intima.

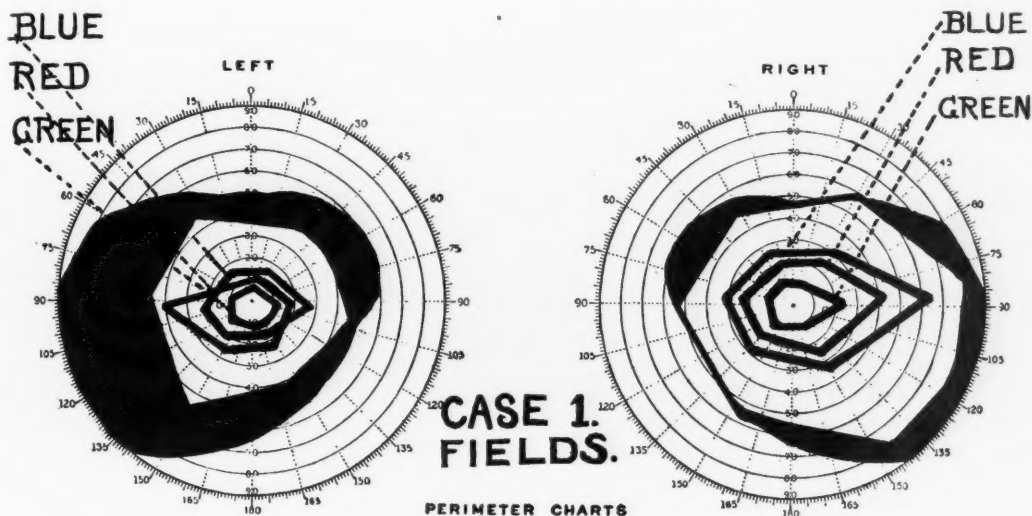
slightly edematous. Fundus otherwise negative.

Left eye. Media clear, disc edematous, blurred and slightly swollen. Veins markedly engorged, irregularly distended, most marked in the superior temporal portion. Retina mottled throughout by diffuse, striated and radiating hemorrhages (nerve fiber layer), the whole retina edematous, in places completely obscuring the veins. Center of the fovea yellowish, hemorrhages darker in color radiate from the center of the fovea.

*Fields*—Right eye. Very slight contraction for form and color. Left eye. Form field contracted, except nasally, temporal field narrowed to 50°, color field for blue and red concentrically contracted and confused; red slightly less proportionately contracted.

Orientation. Excursion normal, both eyes.

Blood examination—B.P. 110, Hemoglobin 95%, R. B. C. 4,980,000. W.B.C. 6550.



C. P. male, aged 38, American, farmer. Entered the Clinic of Ophthalmic Surgery December 15, 1913, complaining of dimness of vision in the left eye.

*History:* Four weeks ago the patient first noticed that his vision in the left eye was blurred. This dimness progressed for two weeks, but has remained stationary since that time. Vision is more blurred temporally and objects seen have a reddish color.

*Examination*—Vision right eye 5/4, left eye 5/20. Lids, conjunctiva and external appearance of eyeball normal. No proptosis as shown by the measurements taken with the exophthalmometer. Tension, right eye, 30 mm. Hg., left eye 23 mm. Pupillary reflexes normal.

*Ophthalmoscopic Examination*—Right eye. Vessels of the retina show slight arteriovenous compression, beginning corkscrew veins, retina

Lymphocytes, small 32%, large 4%  
Polynuclears, neutral 60%  
Polynuclears, eosin 3%  
Transitional 1%

No other forms seen in count of 250 cells.

*X-Ray Report*—Plates negative, except for slight shadow just to the left of vertex at termination of middle meningeal artery.

Otolaryngologic report negative. Wasserman report negative. Medical report, palmar emphysema, urine negative, blood pressure normal. Tuberculin reaction negative.

This case presents a negative history, except for loss of vision coming on gradually. Ophthalmoscopic examination revealed a typical picture of obstruction of the central retinal vein.

A thrombosis in the central vein or in its branches causes ophthalmoscopic appearances which were formerly credited to embolism of the central artery or to hemorrhagic retinitis.

The pathologic aspects of venous thrombosis have been admirably investigated by Coats. Clinically when one sees large hemorrhages and enormously swollen and tortuous veins partly buried in retinal edema, obstructions to venous return flow must be considered. When these changes are limited to one eye, and there is no exophthalmos or other evidence of obstruction of the ophthalmic vein, the conclusion seems inevitable that the obstruction must be in the central vein and not farther back.

There may be signs of widespread vascular disease in the form of thickened peripheral vessels and cardiac hypertrophy, or, of nephritis.

Pathologic examination of a large number of cases has shown that the obstruction may be due to a thrombosis, to a proliferation of the intima, or to a combination of these conditions. The loss of vision is more sudden in cases of thrombosis and there are no prodromal symptoms.

According to Parsons the different pathologic changes which have been put forward in explanation of the clinical picture of thrombosis of the central vein are as follows:

1. Thrombosis in the central vein.
2. Occlusion of the central vein by proliferation of the intima, but without thrombosis.
3. Multiple thrombi in the retinal veins, but without a thrombus in the central vein.
4. Multiple emboli or perhaps thrombi in the retinal arteries.
5. Changes in the retinal vessels, (degenerative).
6. Hemorrhage into the substance of the optic nerve.

Several cases are recorded in which on pathologic examination no thrombosis nor other impediments were found in the veins. Usually the thrombus or other obstruction is situated either at the lamina cribrosa, or a short distance behind it, more rarely at the point where the central vein makes its exit from the nerve.

These cases of thrombosis of the central retinal vein are prone to be followed by glaucoma, and as it is for the relief of this complication that enucleation becomes necessary, it is sometimes difficult or impossible to differentiate between the primary and secondary pathologic changes.

**Frequency**—Thrombosis occurs about once in three thousand ophthalmic cases and most frequently in persons accustomed to much toil, and especially to much stooping. Of the 20 cases reported by Ammann, 13 occurred in farmers who did gardening, and 2 others in smiths. Nearly all of the cases reported occurred between the ages of 40 and 80. Men were more often affected than women. Most of the cases showed marked angiosclerosis.

**Diagnosis**—The gradual loss of vision, in the case here reported, together with the absence of all symptoms suggesting the source of a

thrombus, leads to the diagnosis of obstruction of the central vein, due to proliferation of the intima.

**Prognosis**—In favorable cases the hemorrhage disappears by absorption and useful vision may be retained. In the majority of cases, however, the vision is lost. A few develop glaucoma and the eye is lost.

Treatment is unsatisfactory.

**CASE II.** A Case of Obstruction of the Ophthalmic Vein due to pistol shot wound.

S. C., male, aged 22, English, cook, entered the Clinic of the Ophthalmic Surgery December 15, 1913, complaining of diplopia, exophthalmos of the left eye, and difficulty in walking.



Photograph of Case II.  
A case of obstruction of the ophthalmic vein.

**History**—Four months ago the patient was shot in the mouth with a thirty-two caliber revolver. Two attempts were made to remove the bullet. Immediately following the accident the pain was severe in the head, most marked at the vortex. About two weeks later, he began to have pain over the left eye accompanied by nausea and vomiting. The attacks came on as often as four or five times daily. They continued several days, then gradually grew less in severity and frequency. The patient now suffers no attacks of nausea or vertigo, but has occasional pain along the course of the left supraorbital vein. Diplopia was first noticed after the operation, but disappeared in four days, to return again three or four days later, and has remained constant since that time.

**Examination**—Vision right eye 5/4, left eye 5/4.

**External examination.** Right eye, negative, left eye, eyelids swollen, conjunctiva of lids normal, ocular conjunctiva congested, especially in the palpebral fissure.

**Eyeball,** marked proptosis, eye easily moved in all directions, and exophthalmos diminished by pressure. Measurement with exophthalmometer, left eye 7 mm. more forward than right eye. Tension with tonometer, right eye 20 mm. Hg., left eye 30 mm. Hg. Pupillary reflexes normal, pupil oval, long axis up and in.

**Ophthalmoscopic Examination.**—Right eye, normal. Left eye, Media clear, nerve head congested, edges blurred, deep physiologic cup, lamina cribrosa seen, whole retina engorged,

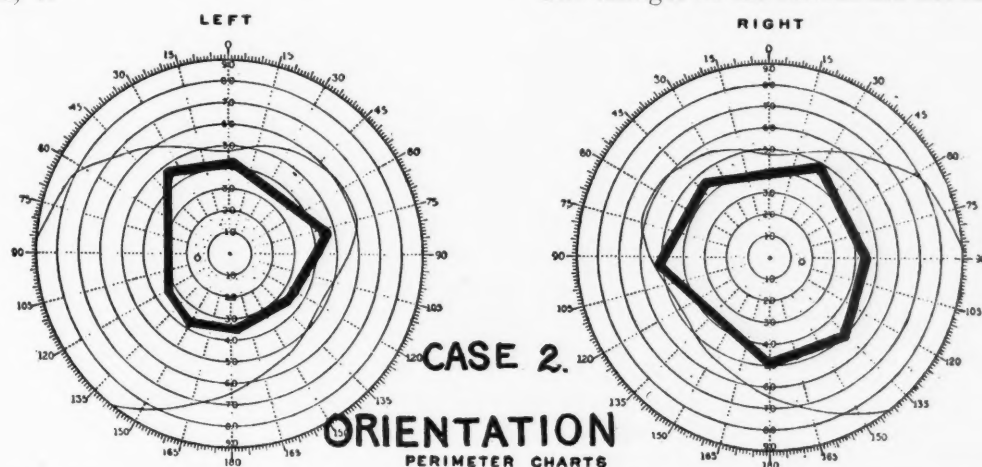


especially the inferior temporal vein, whole retina edematous.

*Fields*—Form field of the left eye, slightly smaller than that of the right. All the color fields are somewhat contracted, no dyschromatopsia or other abnormality.

*Fields of Fixation*—Although the excursions appeared nearly normal, the fields of fixation show a slight limitation of the movement in temporal fields, more marked in left eye.

*Blood Examination*—B.P. 110 mm. Hg. Hemaglobin, 90%. R.B.S. 5,400,000; W.B.C., 10,450; Myelocytes, 0; Normoblasts, 0; Megaloblasts, 0.



Lymphocytes, small	15.8%
Large	1.5%
Transitionals	4.4%
Polynuclear Neutral	75.9%
Polynuclears Eosin	1.6%
Mast cells	.7%

*X-Ray Examination*—There is a foreign body apparently in the petrous portion of the temporal bone. It lies about on a line connecting the two external auditory meati and possibly slightly in advance and a trifle below. Its upper margin is tangent with the lower margin of the left external auditory canal and about one-third of the distance from the sagittal plane to the auricle. No fracture lines can be discovered. Skull is otherwise negative.

*Otolaryngologic Report*—Bullet wound in left soft palate; powder marks.

*Nose*: Vary badly deviated septum with small shelving spur on floor making contact.

*Ears*: Show no result of injury. Patient has spontaneous nystagmus of horizontal and rotary character.

Apparently both cochlea and vestibule of the left ear are quite destroyed.

Hearing in right ear, whisper 21 ft.

1-12-14. Vertigo test is diminished.

Hearing: Whisper in right ear normal; in left ear whisper test one inch, voice 12 to 18 inches.

Thrombosis of the ophthalmic vein is accompanied by pain over the brow, along the course of the supraorbital vein, marked chemosis of the conjunctiva, with absence of the subconjunctival hemorrhages, proptosis (non-pulsating and partially reducible by pressure), diplopia which may be accompanied by vertigo, nausea and vomiting. Ophthalmoscopic examination reveals veins moderately engorged, nerve and retina edematous.

As the course of the bullet was along the floor of the orbit, the pressure on the vein must have been due to fracture with displacement of bone in the orbit.

The changes in the fundus are not so marked

as in Case I, because the lesion being farther back, allows the collateral circulation to become established, the communication between the orbital and facial veins being very free.

**CASE III.** A case of hemorrhage at the base with pressure on sinus, deafness on left side, paralysis of the extrinsic muscles, nystagmus, and disturbance of return venous flow as shown by swelling of lids, marked chemosis of conjunctiva, engorgement of the retinal veins and protrusion of the eyeball.



Photograph of Case III.  
A case of hemorrhage at the base of brain with pressure symptoms.

A. B., aged 20, American, occupation farmer, entered the clinic of Ophthalmic Surgery November 3, 1913. The patient was referred by Dr. M. S. Gregory, Eureka, Mich.

*History*—Eight weeks ago the patient fell from a bicycle severely bruising and scratching the right side of his face and head. There was some contusion of the right orbital region, although the eyes were not injured.

Four weeks ago the patient began to have pain in the left eye, which extended from the region of the eye to the top of the head. This was followed by photophobia, lacrimation, and gradual failure of vision. The eyeball became red and the lids swollen. Within a week the eye began to protrude and the patient suffered from headache, nausea and vomiting. He feels fairly well when not nauseated and when the headache is not severe; his appetite is good. Diplopia at first was denied, but afterwards admitted.

*Examination*—Vision, right eye 5/5, left eye, 5/30. Marked scarring, fine linear parallel lines, along right side of the face.

*External Examination*—Right eye. Palpebral aperture widened, lids slightly retracted. Eye cannot abduct beyond the median line, elevation and depression about normal, abduction slightly limited. Iris reflexes normal. Left eye, marked exophthalmos. Partial

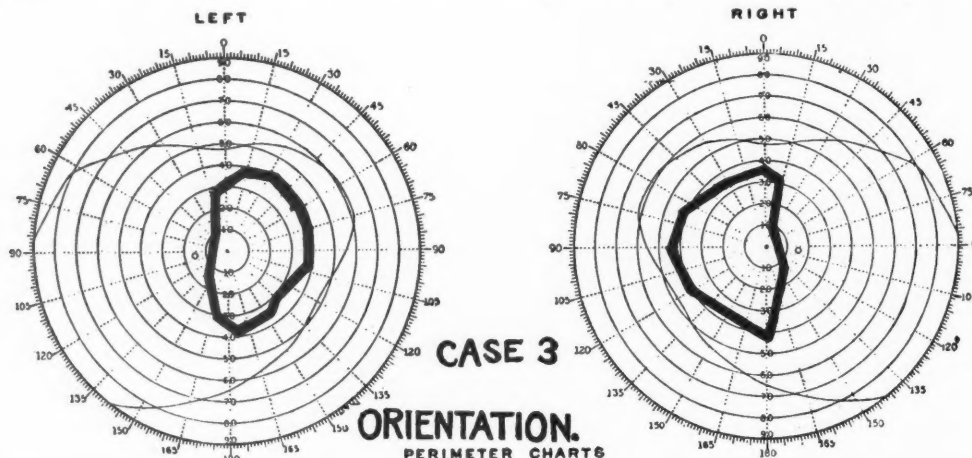
arteriovenous compression, otherwise normal. Retina and choroid normal, macula practically normal, possibly slight edema.

*Left eye.* Disc rings visible, but blurred so that disc borders are quite indefinite. Slight exudate overlying lower nasal border of disc. Veins markedly engorged and tortuous, arteries normal. Distinct arteriovenous compression. Retina hyperemic, edema marked; retina down and temporarily swollen and infiltrated. Macula markedly edematous, foveal reflex lost. No hemorrhages present in fundus. With fingers, slight pulsation of orbital contents, which could also be seen on close observation, probably transmitted.

*Treatment*—Protective pressure bandage applied and patient kept as quiet as possible. Atropin to keep pupil moderately dilated.

11/28. Fields. Right, normal. Left, slight contraction of form and color fields.

Orientation fields. Right, normal nasally, very markedly limited temporally. Left, mark-



ptosis, upper lid; cornea 1/2 covered. Eyelids cannot be closed because of chemotic swelling of the conjunctiva. Eyelids not thickened, some dilation of veins with edema of lid margins, upper lid freely movable, very slight discharge of a faint amber tint. The conjunctiva of the upper lid is congested. Ocular conjunctiva. Upper half-veins prominent, distended and twisted from limbus to fornix, no especial ciliary injection, as such. Lower half swollen, chemotic, opaque, protrudes between lids so eye cannot be closed. Position of the upper lid limits the conjunctival swelling so the border is nearly horizontal. Corneal surface slightly stippled. Iris congested but no marked iritis. Pupils freely movable. Reflexes normal. Exophthalmometer shows left eye protruding 19 m.m. being 7 m.m. further forward than right eye. Excursions limited. The eye is convergent about 20°. Tension normal.

*Ophthalmoscopic Examination*—Right eye. Disc slightly blurred and hyperemic otherwise practically normal. Vessels not tortuous, slight

ly limited temporally, less nasally, slightly limited below.

Diplopia chart. Marked homonymous diplopia, varying but little in all nine positions.

Blood and urinary examination negative.

X-Ray Examination, negative.

Otolaryngologic Report. Spontaneous nystagmus of intracranial character. Hearing test, whisper in both ears.

Neurologic Report. Paralysis of external rectus, both sides. Some nystagmus on rotating right eye to the left; otherwise negative.

Wassermann Report. Negative.

*Subsequent History*—At no time has there been an increase in temperature or change in the blood.

11/13. Slight improvement. Less pain in eyes and head.

11/21. Eye can now be nearly closed, movements better, conjunctival swelling much reduced. Patient more comfortable.

11/28. Exophthalmos reduced to 3 mm. Vision, right eye 5/5; left eye, 5/30.

12/1. Ophthalmoscopic Examination. Disc swollen 1 diopter; retina more opaque, rendered hazy by diffuse exudate, edema more marked. There are now many minute circumscribed hemorrhages temporally mostly small and rounded; some large and more diffuse.

12/10. Chemosis of the eyeball has disappeared and tortuosity of vessels now quite as marked below as above. Fundus the same. Exophthalmos 4 mm.

This case presents a non-pulsating monocular exophthalmos with marked chemosis of the conjunctiva, engorgement of retinal veins, edema of the retina with hemorrhages, together with diminished hearing on the same side, nystagmus of intracranial type, and paralysis of both external recti. There are no evidences of infection or inflammation as shown by the absence of fever and blood changes.

#### DIAGNOSIS

Tumors of the orbit either primary or secondary to sinus involvement can be excluded by the mobility of the globe in all directions and partial disappearance of exophthalmos on pressure. The vascular tumors, aneurism or aneurismal varix, may be eliminated by the absence of distinct pulsation or a bruit. Thrombosis of the ophthalmic vein could give all the symptoms referable to the eye, but could not account for the loss of hearing, paralysis of the external recti, nor the presence of the nystagmus. Thrombosis of the cavernous sinus might give the eye symptoms here present, but all the nerves which traverse the sinus are liable to injury, the third being nearly always affected. Again in cases of cavernous sinus thrombosis, through the medium of the circular sinus, the process may extend to the other side, a complication which occurs in more than 50 per cent. of the cases (McEwen). Then, through stasis in the emissary vein of Santorini, edema over the mastoid may occur if the lesion originates in the sinus.

The history of traumatism followed by the symptoms as given, together with the marked improvement observed since the patient came under observation, seems to justify the diagnosis of hemorrhage, leading to pressure symptoms. The cause of the double abducens paralysis is difficult to explain.

#### DISCUSSION.

DR. GEO. SLOCUM: These cases are indeed exceedingly interesting, more especially, by reason of the difficulty in the diagnosis of the cases presenting exophthalmos, and because of the points of similarity of the vascular fundus lesions, all of which are due to interference with the venous return flow. In the cases with exophthalmos one must differentiate between cavernous sinus thrombosis and venous compression or obstruction resulting from the

trauma. In cavernous sinus thrombosis there is often pronounced exophthalmos with venous obstructions. However, in cavernous sinus thrombosis, pronounced and severe symptoms of sepsis are present. These cases do not present such symptoms and the blood examination is negative. Two-thirds of the cases of cavernous sinus thrombosis depend upon disease of the middle ear, and septic sinus thrombosis is always fatal unless surgical interference is successful. We have no ear disease in these cases. Marasmic sinus thrombosis is not always fatal but this form occurs only in the two extremes of life.

In the second case presented there must have been some fracture of the bone where the bullet passed through the base of the skull, but X-ray examination failed to reveal its location. A fracture might have occurred at the base, in the neighborhood of the sella turcica, causing a displacement of a fragment of bone, which could produce a compression of the anterior end of the cavernous sinus, sufficient to impede the return flow from the ophthalmic vein. Lack of the usual anastomotic connections of the ophthalmic vein would then result in pronounced exophthalmos with diplopia, from a simultaneous compression of some of the nerves of the eye muscles, all of which pass through, or in the walls of the cavernous sinus.

In the case of the patient who was thrown from a bicycle, no fracture was discovered by the X-Ray however, a fracture of the body of the sphenoid at the side of the sella turcica, too small to be revealed by the plate, might easily produce a hemorrhage from the vessels of the diploe, which could compress the sinus from below where the sinus wall is very thin, sufficiently, to obstruct the return flow from the ophthalmic vein and thus produce the symptoms. This would answer all the questions presented in the diagnostic study, with the exception of the bilateral abducens paralysis in the last case. Whether the hemorrhage came from such a fracture of the sphenoid or whether it came from the rupture of one of the blood vessels in the immediate neighborhood of the cavernous sinus is a question for consideration but when we remember the dense fibrous character of the upper wall of the sinus and the fact that the sinus is thereby held firmly open, even when empty of blood, the probability of a hemorrhage on the upper surface of the cavernous sinus producing pressure, appears remote. It would therefore seem more than probable that the hemorrhage occurred from the under surface of the cavernous sinus, that is, from broken veins in the diploe. The possibility, that a fragment of bone from such a fracture might take part in a compression of the sinus in this case also, must be considered.

DR. PARKER (closing the discussion): There is one condition in the last case reported that does not seem to be fully explained, namely, the paralysis of the external rectus in each eye. The absence of diplopia would suggest the possibility of the existence of a lesion of long standing, independent of his accident. Patients who develop a sudden paralysis of the ocular muscles usually complain of the double vision as the most distressing symptom, while this patient suffered little or no discomfort from this symptom. A fracture of the sella turcica might lead to pressure on the sixth nerve on both sides, while the resulting hemorrhage might be limited to the left side. It would not be difficult to imagine a fracture at this point which might not be demonstrable by the X-ray. These are rare cases, and to have all three under observation at one time is most unusual.



- (1) A CASE OF HYDRAMNIOS AND TWIN PREGNANCY.
- (2) A CASE OF ABDOMINAL CESAREAN SECTION FOR AN OBLIQUELY CONTRACTED PELVIS.

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I have for your consideration this evening two obstetric cases showing features of interest.

**CASE 1.** Mrs. W., age 28, entered the Maternity Clinic November 8, 1913, complaining of dyspnea, great abdominal distention, inability to retain food by mouth and difficult urination. Her history was negative until the present pregnancy. She had had five children, all living, without complication during the pregnancies and puerperia, and one abortion at two and one-half months, cause unknown. From her history, she was six months pregnant. The present pregnancy had been in all respects uneventful until the fifth month, four weeks before entering the Hospital. At this time she first began to notice a rapid abdominal distention, accompanied by difficult respiration. In three weeks the waist line increased slightly more than six inches. For several days prior to coming to the Hospital she had been unable to lie down, or to retain food and urination had become difficult. Quickening was first noticed at the beginning of the fifth month, and movements had been felt daily since.

**Examination:** General: Patient of moderate build, good nutrition, pulse 118, respiration 26, temperature 98.6°. Conjunctivae and mucous membranes of good color. Face flushed and anxious, dyspnea marked, slight cyanosis of lips.

**Thorax:** Lungs negative. Heart displaced outward and upward. Breasts: pendulous, Montgomery's follicles enlarged, primary and secondary areola present. Colostrum easily expressed.

**Abdomen:** Markedly distended from pubes to ensiform, symmetrical, domeshaped, much larger than full term pregnancy. Slight bulging in flanks. (Figure 1.) Broad striae in lower quadrants. Linea nigra to umbilicus. Palpation gave very cystic feel, some edema above symphysis. No tumor mass felt. Fetal parts not made out. No movable areas of dullness. Auscultation showed a faint fetal heart in the left lower quadrant half way on a line between umbilicus and anterior superior spine, rate thirty-six to quarter minute. A second fetal heart could not be heard, although the possibility of twin pregnancy was thought of. There was marked edema of the feet and abdominal wall above symphysis.

**Vaginal Examination:** External and internal perineum lacerated. Marked Chadwick's sign. Moderate whitish vaginal discharge. Cervix: old bilateral laceration, soft and patulous. Admits finger with ease. A fetal head at superior strait, freely movable.

**Diagnosis:** From the above findings, combined with the history of rapid distention, a diagnosis of hydramnios was made.

**Treatment:** As it was obvious that the patient could not continue throughout pregnancy in her present condition on account of the daily increasing distention and inability to eat or sleep, it was decided to puncture the membranes through the cervix for immediate



Fig. 1. A case of hydramnios with twin pregnancy.

relief. The patient was accordingly prepared for operation and put upon the table, but was unable to lie flat on account of the dyspnea and had to be supported. The membranes were punctured with a fine trocar as high up as possible and four liters of amniotic fluid drained off with immediate relief to the patient who fell asleep for the first time in several days.

The patient was immediately put to bed in the hope that with the high puncture of the membranes only a portion of the amniotic fluid would come away. However, the fluid continued to drain and three or four liters came away in the bed, making in all between seven and eight liters. The uterus was mas-

saged to facilitate contraction and the patient left in good condition. About six hours later, the patient went into labor and was delivered of still born, premature double ovum male twins. The puerperium was uneventful and the patient left the hospital on the thirteenth day in excellent condition. The Wassermann reaction was negative.

Hydramnios occurs about once in two hundred pregnancies. Minor degrees with two or three liters of amniotic fluid are not uncommon, but the more marked grades are not frequent. In rare instances the uterus may contain an almost incredible amount of fluid, Küstner having observed fifteen liters at the fifth month, and Schneider thirty liters at the sixth month.

There has not as yet been a satisfactory or universally accepted idea as to the etiology of hydramnios. From the fact that the amniotic fluid is normally derived from the fluids of the mother which have been modified by the secretory activity of the amniotic epithelium, while the fetal kidneys take no part in its production, except in abnormal cases, it is impossible to give an explanation for its excessive production which will be applicable to all cases. Generally, however, authorities agree that the excess of amniotic fluid may be derived from several sources: from the fetus, from the mother, from the mother and fetus and occasionally from the amnion. According to Williams, "in something less than one-half the cases careful examination of the fetus after death reveals some abnormality which may or may not bear a causal relation to the disease. Most frequently the abnormality which is supposed to give rise to hydramnios is to be found in lesions which cause obstruction to the circulation, either in the cord or within the foetus." Opitz observed cirrhotic changes in the liver in all his cases. Woerz and Bar, and Nuberding found heart disease. Many authorities believe hydramnios to be due to an excessive urinary secretion. In Wilson's analysis of fifty-one cases of hydramnios occurring in multiple pregnancy, twenty-two of the twins were uniovular and when we take into consideration that these are much less frequently observed than the double ovum variety it becomes evident that something connected with the former has a bearing on the excessive production of amniotic fluid. As a rule, the hydramnios is limited to a single amnion. The kidneys and heart of the fetus having hydramnios are both actually and relatively larger than those of the other twin. At times cardiac and renal disease or visceral syphilis in the mother are associated with edema of the placenta and an increased transudate into the amnion. Wolf has shown that nephrectomy in pregnant rabbits is followed by increased renal activity on

the part of the fetus, with consequent hydramnios. Occasionally inflammation of the amnion itself is supposed to favor the production of the condition.

In the case under consideration it was at first thought that the twins were uniovular because of the firm fusing of the placentae. On more minute examination, however, two separate placentae could be distinguished although they could not be separated. The membranes were rather badly torn but the remnants of two chorions could be found. This was proof that the twins were of the double ovum variety. At autopsy the larger twin weighed 1080 grams, the smaller 730 grams. According to the pathologist, Dr. Warthin, the fetal heart of the larger twin was larger than normal for the size of the fetus, while that of the smaller was subnormal for its size. In the light of these findings the fact that the twins were double ovum can be explained only in one way; that contrary to the rule in double ovum twins the blood spaces of the two placentae had fused as well as the surrounding tissue and that to all intents and purposes they were single ovum twins in which the stronger heart had dominated the circulation and enlarged at the expense of the weaker.

#### CONTRACTED PELVIS, CESAREAN SECTION.

CASE II. M. S., age 23, primipara, entered the Maternity Service September 24, 1913. Her family history is negative. Her personal history shows one incident bearing on the case. At the age of two and one-half years the patient fell, severely injuring the right hip. After this accident she was in bed for a year and did not walk again for eighteen months, and then with a limp which has persisted. There are no points of interest in the history of the present pregnancy which was in all respects normal. The Wassermann reaction was negative. The following are the points of interest in the physical examination:

*Abdomen:* Domes shaped, many fresh striae in lower quadrant, faint linea nigra to umbilicus. Fundus at time of first examination, two finger breadths above the umbilicus. Fetal breech in fundus, back on right, small parts on the left. Fetal heart best heard in right lower quadrant, one-third the distance on a line from umbilicus to anterior superior spine. Position, right occipito-anterior.

The right leg is ten centimeters shorter than the left, and is fixed at hip. The pelvis tilts forward and the patient has a marked lordosis. (Figure 2). With the patient on her back the lumbar region cannot be brought closer than seven or eight centimeters to the table. The left anterior superior spine is two centimeters higher than the right.

## PELVIMETRY:

Intercristal .....	25 cm.
Interspinous .....	25.5 cm.
Bitrochanteric .....	29.5 cm.
External conjugate .....	16.5 cm.
Pubic angle .....	85°
Bis-ischial .....	8 cm.
Antero-posterior of outlet ...	11 cm.
Anterior sagittal .....	5 cm.
Posterior sagittal .....	8 1/4 cm.
Diagonal conjugate .....	11 cm.
Conjugate vera .....	8.5 to 9 cm.



Fig. 2. Obliquely contracted pelvis ducts to early injury of the right hip. Cesarean section at term.

The X-ray confirmed the diagnosis of right occipito-anterior position and showed that the pelvis was asymmetrical. The neck of the right femur had almost entirely disappeared from what was in all probability a tuberculous process dating from the patient's fall when two and one-half years of age.

The classification of the pelvis is interesting. In the first place the deformity is asymmetrical. From the extra weight on the sound or left leg and the shortening in the right, the left side of the pelvis is shoved upward and compressed anteroposteriorly, giving an obliquity to the superior strait. The compensatory lordosis throws the promontory forward and increases the angle of the pelvic inclination with, as a consequence, a shortening in the external diagonal and true conjugate, giving a flat pelvis. Ordinarily the small difference between the intercristal (25 cm.) and the interspinous (25 cm.) diameter would make us suspicious of a rachitic pelvis, but as the patient gives no history and had no other signs of the disease, this can be ruled out. The bis-ischial diameter of the outlet measures eight centimeters, which is just within the limit of the "funnel pelvis."

Taking into consideration the obliquity of the superior strait there is present an obliquely contracted, flat, funnel pelvis.

It is in these "border line" cases with the conjugate vera of 7.5 to 9 centimeters that the greatest difficulty is found in predicting the course of labor. In the case under consideration (conjugate vera 8.5-8) with the position right occipito-anterior, it was thought that labor would probably be spontaneous as the bi-parietal diameter was in relation with the long right oblique and as the child was of moderate size. However, upon second examination it was found that the position had changed to left occipite-anterior, the bi-parietal diameter now corresponding to the short left oblique diameter. In the light of this change of position, it was decided that the outcome of labor would be doubtful, inasmuch as even if descent did occur all obstacles to labor might not be overcome, since in many cases the inward projection of the ischii leads to faulty rotation. In the interests of both mother and child, Cesarean section at term seemed the procedure of choice.

*Operation:* The patient went into labor November 23, 1913 and was allowed to proceed for four hours. Rectal examination then showed the head still movable at the superior strait, and the patient was taken to the operating room for Cesarean section. The classical conservative operation was performed by Dr. Peterson, the patient returning to bed with a pulse of 80. The child was a healthy male and required no resuscitation. The convalescence was in all respects uneventful, both mother and child leaving the Hospital on the twentieth day after operation.

## REFERENCES.

- Bar. Recherches pour servir a l'histoire de l'hydramnios. Thèse de Paris. 1881.  
Chiari. The Relation of the Amnion to Human



Malformations. *Bull. Johns Hopkins Hosp.* 1911. XXII, 35-39.

Neiberding. Zur Genese des Hydramnios. *Arch. f. Gynäk.* 1882, XX, 310-1316.

Opitz. *Beiträge zur Aetiologie des Hydramnios. Zentralbl. f. Gynäk.* 1899. 553-560.

Williams. *Obstetrics*, 3rd edition.

Wilson. Hydramnion in Cases of Uni-oval or Homologous Twins. *Tr. Lond. Obst. Soc.* 1899, xli, 235-272.

Woerz. Ein Fall von Hydramnios. *Zentralbl. f. Gynäk.* 1895, XIX, 580-581.

Wolff. Über Experimentelle Erzeugung von hydramnion. *Arch. f. Gynäk.* 1904. lxxi, 224,257.

#### DISCUSSION.

DR. REUBEN PETERSON: Acute hydramnios is rather a rare disease of pregnancy and interesting, since its causes are rather obscure and it usually calls for active treatment if the patient is to obtain any relief. If my memory serves me correctly I have seen at least four cases of this complication. In three the condition was associated with monstrosities, that is, in each instance the fetus was malformed, which probably had something to do in causing the excess of amniotic fluid. In each instance the membranes were punctured in order to relieve the patient of her distressing symptoms.

The same method was employed in the withdrawal of the fluid as described by Dr. Seeley, the membranes being punctured high up with a fine needle. The fourth case came on toward the end of pregnancy, the child being especially large. The membranes ruptured spontaneously, fortunately without prolapse of the cord.

It must be borne in mind that postpartum hemorrhage is quite common after hydramnios, either acute or chronic and must be guarded against. Chronic hydramnios is much more common than the acute form of the complication. Personally I have never seen good result from bandaging. Premature labor is very apt to result. With rupture imminent, puncture of the membranes is better than waiting, since spontaneous rupture is very apt to result in prolapse of the cord or malpresentation.

In reference to the case of Cesarean section, it seemed to me advisable with the deformity present to allow a test of labor. Even if the position of the fetus had not changed at the last, I do not believe the child could have been born alive by the natural passages, either with or without instruments. Elective Cesarean section at the beginning of labor before rupture of the membranes, in the absence of vaginal examinations, ought to be practically without mortality for both mother and child.

# The Journal

OF THE

## Michigan State Medical Society

ISSUED MONTHLY UNDER THE DIRECTION OF THE COUNCIL

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Subscription Price—\$2.00 per year, in advance.

### MARCH.

### Editorials

#### DUES—LAST NOTICE.

By direction of the House of Delegates all members whose dues remain unpaid on April 1st will be placed upon the suspended list, their JOURNAL discontinued and legal protection be denied them during the period of their suspension.

Are your dues paid? If not please send your check at once to your County Secretary. A two cent stamp on an envelope containing your check and addressed to your County Secretary will obviate your suspension. You cannot afford to be negligent in this matter.

#### PROSTATECTOMY.

Impartial judgment of the relative value of any surgical procedure is to be had only in the light of exact knowledge of the embryology, anatomy, physiology and pathology of the part involved.

The prostate gland, now for a long time the ground for much contention as to the proper avenue of approach in operations for its partial or entire removal, has, until very recently been described by anatomists as a gland consisting of two lateral lobes connected by an isthmus or by a wedge-shaped portion lying between the ejaculatory ducts and the posterior portion of the urethra. They are uniform in the paucity of their description, and in their lack of a comprehensive study of the relations, upon which much light has been thrown by the excellent research of the past few years.

Among those who have developed the embryology, histology, anatomy and pathology of

the gland to the point of definite knowledge are Young, Geraghty and Stevens 1906, von Frisch 1910, Geraghty and Boyd 1911, Tandler and Zuckerkindl 1911 and Lowsley 1912. These five reports cover practically all that is of value pertaining to these phases of the subject.

That there might be no confusion in terminology, it would seem advisable to sum up concisely our working knowledge of the recent data upon the developmental anatomy of this highly important structure.

According to the conclusive work of Lowsley, the prostate is composed embryologically of five distinct lobes, and within the past two months the same author has demonstrated the undoubted persistence of the same divisions in the adult gland.

These divisions consist of an azygos middle lobe, situated between the bladder and the ejaculatory ducts, under the floor of the urethra (prespermatic and post-urethral); two lateral lobes, arising from the prostatic furrows and lateral walls of the urethra and extending laterally and posteriorly from that structure; a posterior lobe lying dorsal to the ejaculatory ducts above their entrance in the urethra and posterior to the urethra below this point (post-spermatic and post-urethral); and a ventral lobe formed by glands arising from the anterior or ventral wall of the prostatic urethra. This ventral lobe has a tendency to atrophy by the twenty second week, though it has been found present in modified form in every post-natal specimen examined. It is, as a rule, inconsequential, but in rare cases, there is a marked hyperplasia, and if there be a concomitant lateral and middle lobe enlargement, there is formed the so-called prostatic *collarette*.

The middle lobe and the lateral lobes are not separated by tissue partitions, but are shown, by careful study, to be independent, though, for practical purposes, this independence of structure is a negligible factor and they may be removed in one mass.

The posterior lobe is the only portion of the gland which can be felt by immediate palpation per rectum. It is separated from the middle and lateral lobes by a lamella of connective tissue of varying thickness and this layer is rather intimately connected with the sheath of the ejaculatory ducts, the whole offering a distinct plane of average in the process of enucleation. In suprapubic prostatectomy it is doubtful if the ejaculatory ducts are ever removed, but, on the other hand, it is also certain that the posterior lobe is not enucleated. This latter fact would be of no importance in true uncomplicated hypertrophy, where the posterior lobe is almost pressed out of existence, forming really a pseudo-capsule, but it would be of great importance in carcinoma, with or without hy-

pertrophy. For, as Geraghty and Boyd have shown, prostatic hypertrophy rarely or never begins in the posterior lobe, and *carcinoma rarely or never begins anywhere else.*

We cannot forbear calling attention to the so-called accessory glandular structures of the prostate, inasmuch as they often lead to confusion in cystoscopic diagnosis, and, being frequently mistaken for middle lobe enlargement, may prove stumbling blocks in the choice of the method of attack. The subcervical group of Albarran occupies a strategic position at the vesical orifice. The tubules of this group lie under the neck of the bladder, between the mucosa and the musculature and the ducts open into the urethra, just over the internal sphincter, so that any slight increase in their size would cause very grave obstruction to urinary outflow, with all the objective evidences of prostatic obstruction. This type of enlargement has been found in over 13% of cases examined; a most important consideration for, when present alone, it does not offer a field for complete prostatectomy, but had better be handled by the partial prostatectomy or "punch" operation of Young, (which heals in a linear scar) or by the *prostatotomy* of Chetwood, as in the case of fibrous median bar or contracture of the vesical neck. If combined with lateral hypertrophy it may be removed en masse with the other lobes by the suprapubic route, or shelled out on a spoon tractor by the perineal route, after enucleation of the lateral and median lobes. The signal position of this enlargement, even when so small as almost to escape attention, renders it, by the same token, an added menace to operative success. For, though urine may often pass with apparent facility through two greatly hypertrophied lateral lobes, the tiniest nub of subcervical enlargement may cause a tremendous residual, with subsequent alarming symptoms of back pressure on ureters and kidneys, and the surgeon is not infrequently surprised to find a persistence of signs and symptoms after a careful perineal removal of a very large prostate, because he has neglected the last but most important step of enucleating this tiny extra-prostatic lobule. In suprapubic operation this lobule is usually removed with the prostate. It has been argued theoretically, that, in the anatomically correct enucleation of Bentley Squier such an enlargement might possibly be overlooked through the very fact of adhering closely to the natural plane of cleavage. The ventral lobe over which Squier begins his enucleation is virtually submucous as far as the urethra is concerned, but lies outside the vesical musculature, while, as before noted, Albarran's lobule lies between the muscle and the mucosa, and in performing a careful, non-tearing operation such as Squier's, one might possibly, in passing from the sub-

mucous to the submuscular plane, leave *in situ*, one, at least, of the possible causative factors in obstruction. The writer would, simply, call attention to the histologic-anatomic disposition of these extra prostatic lobules. It is true that they lie in different histologic planes from the middle lobe, but the fact that the ducts of Albarran's lobe enter the floor of the urethra just proximal to those of the middle lobe, with no sharp line of demarcation between, make it almost impossible to miss them by this method.

(From the most recent observations it seems probable that where there is enlargement of Albarran's glands, together with prostatic hypertrophy, that the latter grows *outside* the sphincter, or at least, lateral lobe enlargements do, and some of the posterior portion of the sphincterics ring is removed with the mass.)

The presence of such a lobe may explain in large part the occasional persistence of residual urine following prostatectomy by the perineal route, as pointed out by Young, although intrinsic enlargement of the trigone and tabes must always be borne in mind as possible contributing factors. Not infrequently does the trigone play an important part in urinary obstruction, a fact which is apparently lost sight of by most observers. In tabes, dilatation of the posterior urethra, and internal sphincter, in conjunction with vesical atony, often give rise to a relative enlargement of the trigone with residual persisting after removal of the gland.

A consideration of the other accessory structures, the so-called sub-trigonal glands of Home would lead us afield, for, though they may cause obstruction, they should never be mistaken for prostatic enlargement. They are rare, only two cases being found in 120 examined by Lowsley at Bellevue.

Queries insistently recur as to the ideal time for performing prostatectomy; as to when, under unfavorable conditions, one dare operate; and there is continuous argument as to the best avenue of approach to the gland.

The ideal time to operate would seem to be as soon as definite obstruction is diagnosed, while the bladder is still compensating and before infection has intervened. To wait for the so-called second stage of obstruction is certainly not ideal, for this period is practically synchronous with beginning back pressure on the kidneys, and with the onset of catheter life and inevitable infection. Granting that in certain cases palliative measures, such as irrigation and dilatation, have proven efficacious, it would still seem, that this is, as a rule, only temporizing, for practically all obstructions are progressive in type. If, under given conditions palliative treatment be deemed advisable, as in cases cited by Bransford Lewis, a few weeks at most should suffice to establish the fact, after



which delay is merely putting off the evil day, for the kidneys will never be in as good condition to withstand sudden change of pressure. On the other hand, to operate suddenly on a case which has lately become infected through instrumentation may prove dangerous, as such cases often become generally septic, whereas the old stager, who has long ago acquired a local resistance may have an uneventful convalescence.

In the class of cases presenting with a long history of obstruction and evident back pressure, a most careful pre-operative treatment is necessary. Whatever be the type of therapy employed, the end result to be sought for is a sign of willingness on the part of the renal parenchyma to react kindly to the change in pressure, brought about by the sudden institution of an inlying catheter regime. Usually the patient has been passing the catheter every six hours himself. This leaves quite a back pressure in the hours immediately preceding catheterization. After prostatectomy the pressure will presumably be removed. The only way then to ascertain what the kidneys will do on this sudden relief of long continued pressure is to institute continuous drainage, studying daily the change in urea concentrating capacity, as well as the tubular function. (Urea concentration may best be studied by the new Soy bean fermentation test of Marshall, and the best colorimetric estimate of daily increase of tubular activity is undoubtedly to be had by the use of Phenolsulphonphthalein.) It is not here a question of the *actual* values but of the *relative* daily rise in elimination. If, under treatment, the function increases ever so slightly with inlying catheter there is little danger of complete suppression whatever other condition may supervene. A phthalein reading of 15% the first hour and 10% the second, increasing to 25% the first hour and 15% the second, has proved, by recent experience, to offer a suitable ground for operation, if urea concentration is good.

Operative interest of today is divided mainly between two methods of approaching the prostate; the suprapubic operation in its various modifications, and the perineal approach as perfected by Young.

The advantages claimed for the suprapubic route are, briefly: facility and expediteness; lower mortality in the hands of the majority of operators; lessened chances of incontinence; and lack of danger of injuring the rectum.

That the suprapubic method is easier and quicker is undoubted. That the death rate is lower is questionable. Mortality statistics of certain expert operators show a decided advantage in favor of the lower route. In the hands of the majority, however, the reverse is true.

The combined statistics of a large number of

good operators show less incontinence from the suprapubic than from the perineal method, but on the other hand Young's statistics show no cases of permanent incontinence in over six hundred perineal prostatectomies. Careful incision of the membranous urethra with a consideration of anatomic relations should preclude this possibility. By the upper route, incontinence is a rare sequella unless the operator forcibly tears through the triangular ligament and external sphincter and, even then, the internal sphincter may regain control if the operator's finger has kept within the muscle ring. By the suprapubic route, injury to the rectum is almost impossible, for the latter is well protected from the operator's finger by the posterior lobe and the fibrous lamella in front of it.

The relative disadvantages offered for the suprapubic method are: greater hemorrhage, longer convalescence in bed, difficult drainage, the fact that the operator works, in most cases, by tactile sense alone; inability to reach the posterior lobe, as in carcinoma, and loss of sexual power.

From a practical standpoint hemorrhage is greater from the suprapubic route, but Squier has recently pointed out that most alarming hemorrhages result from the usual attack on the most prominent portion of the gland, the operator's finger passing posteriorly *outside* the sphincter and immediately encountering the posterior plexus of veins. This danger is abrogated by beginning enucleation over the anterior submucous lobe, and keeping within the sphincter as the finger sweeps posteriorly. It is scarcely necessary to mention the fact that the prostate in process of hypertrophy, grows up between the urethra and sphincter, pushing the latter outward and flattening it into a thin band, so that it is very easy for the finger unwittingly to slip outside it. There is, however, always considerable hemorrhage from the trigonal vessels. Keyes has, within the month, proposed to control hemorrhage by passing a suture on a Peaslee needle from without, through the intact perineum, catching the flap of bladder mucosa on each side, re-inserting the needle through the perineum and bringing back the suture to the perineal surface at a point opposite the initial puncture. Both of these methods undoubtedly aid in the control of hemorrhage, but it is probable that the method of Lower, of allowing a carefully dissected flap of bladder to fall into the wound is even more helpful in this regard.

In the comfort of the patient and rapid convalescence, the perineal route offers superior advantages. The tubes and packing are removed in twenty four hours and the patient sits up in a wheel chair on the second day after operation, with dependent drainage, while by the suprapubic method the patient, at best, is long-

er in bed and even with a carefully applied Walker pad, is decidedly uncomfortable.

It is an error however, to claim that drainage is better by the perineal route, for, with a high bladder incision, the symphysis does not obstruct drainage, and moreover suprapubic cases do not altogether depend upon gravity for drainage, but mainly upon abdominal pressure.

That the operator works by the tactile sense alone is true in most cases, but this is not necessary, as demonstrated in the technic of Lower. To reach the posterior lobe is practically impossible by this route. That the sexual power is destroyed by this method is doubtful, for the ejaculatory ducts are surrounded by a dense fibrous sheath, imbedded in turn in the interlobular lamella. The real danger here, lies, not so much in extirpation of the terminals of these ducts, as in trauma to their walls with subsequent *epididymitis*.

The advantages claimed for the perineal route are: the ease of access to the prostate; the clear view obtained; the ability to use other instruments than the finger, as in the case of fibrous non-enucleable glands; the fact that carcinoma can be handled by this method only; the shorter and more comfortable convalescence, which is all important in the aged; decreased mortality in expert hands; lessened hemorrhage and sepsis; no cases of incontinence following careful dissection; preservation of the floor of the urethra with the vesical sphincter, verumontanum and ejaculatory ducts, thus lessening the tendency to *epididymitis* from ascending infection, and to post-operative impotence.

The ease of access to the gland, the excellent view obtained and the ability to use other instruments than the finger would make it seem the reasonable avenue of approach in attacking non-enucleable fibrous or myofibromatous prostates, which types were found singly or combined in 17% of the 120 case studied by Geraghty.

Microscopic study of serial sections has demonstrated that, at the apex, the developing tubules run in a caudad direction and are more firmly imbedded in the capsule than elsewhere. This is an important consideration, for it is questionable whether some of the tubules are not left behind in suprapubic enucleation to cause later trouble, whereas, in the perineal method, these apical adhesions are snipped away by scissors, in full view of the operator.

Carcinoma occurs in about one case in five of all enlarged prostates in men above fifty. As previously stated, carcinoma rarely or never occurs outside the posterior lobe, advancing in the line of least resistance over the base of the prostate, here no longer protected by the fascia of Denonvilliers and passing along the seminal vesicles and into the intervesicular space. From the schirrus nature of the type found here and

the confined avenue of growth, it would seem rational to approach all such cases by the perineal route, either for conservative or radical excision; for, in Young's method, the posterior lobe is fully exposed to view, and, if carcinoma be suspected, an exploratory incision or excision, for immediate frozen section, may, under favorable circumstances, sanction a radical operation.

The shorter convalescence by this route is a great factor in the prevention of hypostatic pneumonia in aged, critical cases. Hemorrhage should primarily be less, for the trigonal vessels are left intact by this method, and whatever bleeding takes place is more easily controlled by packing the collapsible fossae of the lateral lobes, than can be practicable in the suprapubic operation. Incontinence should never take place if careful technic be observed, and the same delicacy in manipulation should lead the operator away from all contact with verumontanum and ejaculatory ducts.

The objections offered against the perineal route lie in the difficulty of the operation, except in the hands of a few; the danger of tearing into the rectum; the possibility of severe hemorrhage from cutting into the bulb; the length of time required for operation; the possibility of incomplete removal, and the fact that this route is claimed by many to be suited only for the removal of lateral hypertrophies or sessile median growths and that median bars and contractions are much better treated through suprapubic incision.

One mistake commonly made in perineal prostatectomy is that the perineal incisions into the gland are not made deeply enough, so as to go completely through the connective tissue layers, separating the posterior from the lateral lobes. This leads the finger or instrument into the outer capsule again, where the anterior capsule of the posterior lobe becomes lost in it, and enucleation of the real offenders, the middle and lateral lobes, is not possible until the incision is made into the capsule containing them.

By the perineal route there is no danger of cutting into the rectum, if the tiny recto-urethralis muscle be sectioned. This muscle holds the anterior rectal wall tightly against the membranous urethra, in part of its length, forming the *vessie du rectum* of the French and on section of this muscle the rectum falls away with ease, leaving a clear view of the periprostatic tissues. Danger of bulbar hemorrhage is minimal as the peri-bulbar tissues stand out plainly as landmarks under careful dissection. The slight increase in time required in perineal prostatectomy is negligible, with the use of anoci-association and nitrous-oxide-oxygen anaesthesia.

If, as has been argued, many prostates are incompletely removed by this route it is be-

cause the operator, after removing the evident enlargements, neglects to examine the oblique, cornu-like cavities which usually run up under the bladder in the direction of the ureters. Not infrequently large masses of hypertrophy lie in these cornua, and if only the lower portions are taken out these upper ligaments slip down later, under the trigone, and cause a recurrence of obstruction.

Contractures of the vesical neck and median bars may be examined with ease through the opening in the urethra. Failure to relieve obstruction is too often due to the desire of the surgeon to remove a large mass of gland, rather than to reduce the obstruction of urination. Examination of the vesical orifice should be the last step in every perineal prostatectomy. Under proper dissection, virtually the whole trigonal area can be examined by this route!

Both fields offer equal opportunity for anoci-association.

From a study of the above facts, one is led to the conclusion that, as a general thing, the suprapubic route is the safer one, but that under proper conditions, the perineal route offers much more satisfactory results, especially in carcinoma and in critical cases.

By whatever route, however, we decide to approach the gland, it should always be remembered that the act of prostatectomy is only one step in the procedure. Exhaustive diagnosis, careful choice of procedure with due regard to all contributing factors, infinite care in technic and a minute pre-operative and post-operative study of physical and chemical equilibrium; these are the steps which, aside from adventitious circumstance, spell success or failure, and which, if carefully considered in their bearing upon each case as an individual problem, will still further reduce the mortality in this most important operation.

H. W. PLAGGEMEYER.

#### UTERINE DISPLACEMENTS

It is safe to say that there is no subject in gynecology concerning which there have been more erroneous ideas or more false teaching than that of mal-positions of the uterus. The older gynecologists wasted much ingenuity and expended much energy in devising methods for the correction of certain positions which in themselves are either of no clinical importance or are but incidents of conditions which are the primary cause of the symptoms.

It was the old idea that the uterus must lie anteriorly and be slightly anteflexed, and whenever it was found in any other position treatment was instituted to make it conform to this conception of the normal. We now know that the organ is subject to considerable variation of position, without any symptoms referable to the change. Thus the whole subject

of anteversion has been dropped and we recognize but one abnormal anterior position, namely, extreme anteflexion of the fundus upon the cervix.

Gradually too, it is becoming recognized that there are many cases of mobile retroposition, especially in the nullipara, which give rise to no symptoms.

Ascensus, the lateral displacements and the torsions are complications, or rather incidents, of a more serious condition, such as pelvic inflammation, uterine myomata or ovarian tumors. Their treatment is not to be disassociated from the treatment of the general lesion.

Retroposition, descensus and prolapsus are the important mal-positions. They are but stages in the progress of the same condition, a retroposition being the first step in the downward progress of the uterus. When not combined with descensus it is doubtful if any symptoms result. Undoubtedly, there are thousands of young women being treated for retrodisplacement who would be far better off if they were let entirely alone or gave of their time and money in endeavoring to build up their general health or to correcting a generally faulty posture.

Retroposition, however, in a woman who has had children, is associated with descensus and it is the descensus, rather than the backward displacement, which causes the mischief. It may require a long period of time for such a descensus to become a complete prolapsus and it is during this time that the invalidism is most pronounced. Once the prolapsus becomes complete, many of the distressing symptoms are lessened.

The operations which have been devised to correct retroposition are many; it is said that they number not far from one hundred and twenty-five. They may be divided into two classes: first, those operations in which new and false ligaments are fashioned for the uterine support and second, those operations in which the normal ligaments are shortened in various ways. In complete prolapse, a third class may be added, that of vaginal fixation.

Operations on the second class are most in vogue, particularly the Gilliam and its modifications, and the Webster-Baldy. The latter is particularly applicable when there is marked prolapse of the ovaries. When the prolapse is at all marked, these operations to be successful must be combined with extensive plastic repair of the pelvic floor. The third type of operation is applicable only when the patient is beyond the child-bearing age or after artificial sterilization.

Of these procedures none is so good as the Watkins operation frequently called the Wertheim vesical fixation. It should be noted that the credit for this valuable method should be given to Watkins of Chicago, who described



the procedure at least a year before the appearance of Wertheim's paper.

Those who attended the Flint meeting of the State Society will recall Watkin's clear description of his technic and *THE JOURNAL* is fortunate in being able to present to its readers, in this issue, Doctor Watkin's paper.

B. R. SCHENCK.

### *Editorial Comments*

The Detroit College of Medicine and Surgery has recently issued a very attractive catalogue and announcement for 1913-1914 composed of 125 pages with several half-tone illustrations. The teaching staff of the college has been divided and sub-divided into ten departments and ten sub-departments, the heads of which constitute the faculty. In all some 168 members compose the entire teaching force and we understand that some fourteen are full time paid professors. It may be safely stated that the college, with the standards adopted during the past year, is bound to accomplish the attainment of a high standard.

The following extract from a letter received from the Secretary of the American College of Surgeons is self explanatory.

"If you will take pains to observe those accepted from your community, it will undoubtedly occur to you that there are a number of other surgeons who should be on the list. In fact, the most effective criticism that could be launched against our organization would be that we should designedly exclude any man who meets the requirements and who would be interested in the organization. While designedly we should not exclude any acceptable candidate, the result will be the same if, through carelessness or thoughtlessness, we fail to include all surgeons of ability. Any such men, if not allying their influence with us, would afford much comfort to the man who is unable or unwilling to meet our requirements for membership.

"We have until November 1st, 1914, in which to suggest for membership surgeons of ability who should be admitted to fellowship without examination. It seems not only proper, but advisable, that each Fellow make himself a committee of one to see that no surgeon of conspicuous availability in his community fails to receive an invitation to join the college. Application blanks will be sent to any surgeon on request of any Fellow.

"This suggestion is not made with the idea of merely increasing in number the fellowship of the American College of Surgeons, but to avoid so far as possible inflicting an injustice upon the College or worthy surgeons by excluding acceptable men from membership."

The Detroit Pediatric Society was organized on January 28th, 1914 with the election of the following officers: President, Dr. T. B. Cooley; Vice-President, Dr. H. M. Rich and Secretary-Treasurer, Dr. Francis Duffield. The object of this organization, as stated in its Constitution and By-Laws, is to study the pathology, physiology and therapeutics of infancy and childhood. Its membership is composed of three classes—active, associate and honorary, with the active membership limited to twenty. The Secretary informs us that the Society is anxious to have associate members throughout the state and those desirous of thus becoming affiliated with the organization may secure information by applying to him. *THE JOURNAL* extends to this new organization its good wishes and offers the pages of *THE JOURNAL* for the publishing of its transactions and the papers that are presented by their various essayists who will appear upon their programs.

The scientific editorial contained in this issue on Prostatectomy is, we believe, of extreme interest and a valuable review of the entire subject. Dr. Plaggemeyer has covered the subject in an impartial manner and has given us the most recent opinions of recognized authorities.

Are there any meetings of your local society that you are failing to attend? There shouldn't be. You owe it to yourself and to your clientele to attend every meeting and actively participate in its deliberations. While your society needs you, you need the society more.

Your 1914 dues are payable and must be in the hands of your County Secretary before April 1st to avoid having your name placed upon the suspended list.

The thyroid gland, in proportion to its size, receives twenty-eight times as much blood as the brain, and five and one half times as much blood as the kidneys.

The exposure made, by *The Journal of the A. M. A.*, of the methods employed by the Bennett Medical College of Chicago in providing by means of fraud for a matriculate's preliminary education: credentials cannot be commended too highly. If there are any other medical colleges guilty of similar offenses we sincerely hope that they will be shown up in a like manner. Such investigations that bring to light existing "rottenness" in our medical schools, added to the work the A. M. A. is conducting in exposing medical fakers and quack nostrums, will cause every respecting member of the profession to express his unqualified approval and lend to this work his moral and material support.

This issue of THE JOURNAL is made possible by the patronage we receive from our advertisers—without this patronage we would be unable to send you such an issue as this. If you desire similar numbers to reach your desk each month it is incumbent upon you to confer your patronage upon these advertisers. Send them your next order—tell them why you are doing so. You owe this co-operation to them, to yourself and to your JOURNAL. Read these advertisements now and show these advertisers that you appreciate their employing advertising space in your JOURNAL.

A pathological condition of the appendix may justly be considered as a causative factor of many reflex symptoms. However, to construe a diseased appendix as the sole and only cause of these reflex disturbances is a danger to be avoided. He who causes his patients to submit to an appendectomy and accomplishes its removal through a "button-hole" incision is not affording that patient the full benefits of the operation. A little larger incision so as to permit an intra-abdominal examination may reveal other conditions that require surgical interference before normal function can be restored. Coexistent with appendical disease there may be a Lane kink, adhesion of the ilium, gall-bladder disease, gastric or duodenal ulcer, or a diverticulum—all surgical conditions which will demand secondary operation if not attended to at the time of the appendectomy.

### Deaths

#### DR. JOHN AVERY.

Dr. John Avery of Greenville died on Jan. 17th, 1914, at the age of 89. He had been president of the Montcalm County Medical Society for several years, but failing in health he was made an honorary member of his County Society as well as of the Michigan State Medical Society. The cause of death was senility.

### Correspondence

Hillsdale, Feb. 14, 1914.

Dr. Frederick C. Warnshuis,  
Grand Rapids, Mich.

My dear Dr. Warnshuis:—

I cannot refrain from offering a word of congratulation, and commendation of your work with the JOURNAL. You have made it a splendid exponent of the profession in Michigan. I know of no state Journal that is its equal. My interest in the advancement of the interests of our body is such that the success of your work gives me the greatest pleasure. We are fortunate in your editorship.

With kindest regards and best wishes, I am,

Yours cordially,

WALTER H. SAWYER.

### State News Notes

Dr. A. M. Campbell of Grand Rapids will leave for Europe during the early part of March.

Dr. A. S. Warthin of the Medical Department of the University, delivered a lecture on Sex Hygiene before the Grand Rapids Y. M. C. A. on Feb. 15th.

Dr. C. C. Fernstamacher and wife of Dowagiac have been seriously ill with diphtheria.

Dr. R. E. Balch of Kalamazoo is spending a couple of months vacation in the southern states.

Dr. J. Earl McIntyre of Lansing was appointed to succeed himself as county physician of Ingham County.

Dr. W. B. Sprague of Palmyra, sustained severe and painful injuries to his face when he slipped and fell under his horse.

Dr. Margaret A. Osborn, mother of former Governor Chase S. Osborn of the Soo, died at her home in South Bend, Ind.

By action of the state board of Registration, Dr. C. J. Kennedy of Detroit has been debarred from practice.

Dr. Russell Boggs of Pittsburg addressed the Grand Rapids Academy of Medicine on Jan. 22nd. His paper was entitled; The Modern Trend in the Treatment of Malignancy.

The State Homeopathic Society will hold its annual meeting in Saginaw on May 12th and 13th.

Dr. Theodore Kolvoord of East Ross has located in Urbandale.

Dr. De-Witt-Carter Adams and Miss Helen B. Brooks of Detroit were married on Jan. 24th.

The next annual meeting of the Michigan Society for the Prevention of Tuberculosis will be held in Muskegon during the first week of October.

Dr. L. H. Chamberlain of Grand Rapids departed for Europe on March 3rd.

Dr. J. W. Vaughan of Detroit has tendered his resignation as Secretary of the surgical section of the State Society. President Kiefer has appointed Dr. E. J. O'Brien, 420 Woodward Ave., Detroit, as the new Secretary of this section.

In our last issue we stated that: "Dr. A. Paterson of Flint was convicted by a jury for being a party to a criminal abortion." It so happens that there are two Dr. Patersons in Flint, both of whom have the initial A. One is a member of the Genesee Society and other is not. In justice to Dr. A. A. Patterson it is but proper that this explanation be made.

Medical Inspector W. C. Braisted, who has just been appointed by Secretary Daniels to be surgeon general of the navy, began his eminently successful career in Washtenaw county.

His father was auditor for the Michigan Central and resided at Ypsilanti. In 1882 Dr. Braisted graduated from the literary department of the U. of M. and later studied medicine and surgery at the Col-

lege of Physicians and Surgeons in New York. For a time he practiced as a surgeon in Detroit, and in 1890 he passed the examination that took him into the navy. Dr. Braisted made a report on the operations of the Russian and Japanese forces in the field at Manchuria which was highly commended by experts. He has been president of the Military Surgeons' Medical association.

Board of Health, Ishpeming, Mich.

Gentlemen: The sample of water received Jan. 24 has been examined bacteriologically with the following results:

Bacteria per cc. at room temp. ....	None
Bacteria per cc. at incubator temp. ....	None
Presumptive test for B. Coli gas production on Lactose B.	
25 cc .....	None
1 cc .....	None
Acidity .....	None
Turbidity .....	None
Indol production .....	None
Red colonies on L. L. A. ....	None
B. Coli .....	None
Potability .....	Safe

This sample of water appears to be sterile and is entirely safe for drinking purposes.

Very truly yours,

M. L. HOLM,  
State Bacteriologist.

Good Health Week for Hillsdale is being arranged for, and the week commencing March 15 has been selected as a tentative date. This was decided upon at a meeting which was held in Dr. W. H. Sawyer's office, with interests of the city represented. The "Good Health Week" will consist of a comprehensive exhibit relating to preventable diseases, proper care of children, pure foods, hygiene and sanitation and also a series of lectures on various phases of good health.

An organization was perfected, and officers were elected as follows:

President—Rev. C. S. Wheeler.

Secretary—Dr. B. F. Green.

The week of March 15 was selected, depending upon what arrangements could be made for exhibits and speakers.

The following committee were appointed:

Executive committee—Dr. W. H. Sawyer, Dr. Bion Whelan, Supt. S. J. Gier, Rev. W. F. Jerome, Dr. B. F. Green.

Exhibit committee—Dr. Bion Whelan, Dr. C. S. Bower.

Program committee—Dr. W. H. Sawyer, Pres. J. W. Mauck, Mayor L. A. Goodrich.

Arrangements committee—Supt. S. J. Gier, Mrs. Alexander Stock, Mrs. B. C. McMillan, F. P. Knapp, Mrs. Sawyer, Mrs. Griffith and Mrs. Bower.

Within the next two months, the capacity of the University Hospital will be increased by 74 beds distributed as follows:

Palmer Ward for Children (additional)	35 beds
New Contagious Hospital .....	24 beds
Medical Pavilion, (Medical, Neurologic, and Dermatologic Services) additional	15 beds
Total number of beds in the Hospital	374.

**RADIUM CHLORIDE.**—Radium chloride is supplied in the form of a mixture of radium chloride and barium chloride, and is sold on the basis of its radium content. Radium Chloride-Standard Chemical Co., Radium Chemical., Pittsburg, Pa.

## County Secretaries Department

We earnestly urge that every County Secretary carefully read the following article and at once comply with the request therein contained.

"By virtue of your office as Secretary of the County Medical Society you are a member of the Association of the County Secretaries of the Michigan State Medical Society. We had a very enthusiastic meeting at Flint, but I believe we can have a better meeting in September if every member of this Association will lend a hand. There are sixty members of this Association. The problems that each one has to face vary more or less in each locality. To overcome these problems you have worked out certain schemes. Each County Secretary studies each respective society from a different view point and as a result of the difficulties that trouble us we wonder what the other fellow is doing to overcome them.

"You would be doing me a great favor if you would kindly answer the three following questions at an early date.

"1. Would you not present a paper before this session upon some phase of your work in which you are particularly interested?

"2. What are the problems that have troubled you most?

"3. What phase of secretarial work would you like discussed at the next meeting of the Secretaries' Association?

"Detailed answers would be greatly appreciated."

This is a copy of a letter recently mailed by the Secretary of the County Secretaries' Association of the Michigan State Medical Society. From the sixty letters mailed four answers were received. From the demonstration of interest one would justly believe there are about fifty-five Secretaries that were sleeping on their job, or on a vacation; but this is not a correct conclusion because a great many of the County Societies are having programs prepared by their respective Secretaries from the reports in JOURNAL. We appreciate fully that County Secretaries are a busy group, in part looking after their Medical Society, and in part struggling for maintenance, and in keeping up with progressive medicine. Aggressiveness in the attack of new problems should characterize the activity of the County Secretary. However, facts are prevalent that laymen have consulted the County Secretary of the local society to marshall the medical forces in a co-operative fight against tuberculosis; but that the Secretary manifested only a lukewarm interest in this country-wide propaganda.

Certainly the Secretary is the one man in the community that can unify medical and lay forces on any sociological problem. Medicine



has more sociological influence and can give greater organized aid now than ever before. There are sects in public life that stand ready to combat any sociological aggressiveness of medical science and put forth a strenuous effort to disseminate a fear that the medical man in particular and the profession in general will become autocratic. Can you imagine anyone that has an innate desire to serve humanity to the point of self sacrifice becoming autocratic? When the public invites us to aid them we should jump at the opportunity, make good and demonstrate our desire to lend a hand, and that we are at all times friends of the public. When we desire medical legislation we must have lay friends to help us. The County Secretary must not only look after the routine, but interest the public in medical progress and make them feel that our problems are frequently their problems as well.

Will every Secretary that has not answered please answer the appended questions now and add your quota of interest in helping on this program.

"Then, welcome each rebuff,  
That turns earth's smoothness rough,  
Each sting that bids nor sit nor stand but go!"  
—Bacon.

CLARKE B. FULKERSON.  
Secretary-Secretaries Association.

Kindly see that we receive all the dues that you have collected before April 1st in order that your members be not unjustly classified as suspended.

Have you any problems that are confronting you and preventing your society from realizing all the benefits of organization? If so, we wish you would discuss them in these columns and thus obtain the advice and assistance of all County Secretaries.

### County Society News

#### EATON COUNTY

The Eaton County Medical Society met in Charlotte Jan. 29th, 1914, with a good attendance.

Dr. H. C. Rockwell of Dimondale gave a report of a case of Elephantiasis, with photographs.

Dr. Howard H. Cummings of Ann Arbor read a paper on Human Blood Therapy. Both papers were freely discussed. Dr. Cumming's paper was interesting, instructive and practical.

C. H. SACKER, SECRETARY.

#### GENESEE COUNTY

The regular monthly meeting of the Genesee County Medical Society was held December 16th, 1913.

Dr. Francis Duffield of Detroit read a paper entitled "The Complications of Broncho-Pneumonia

in Children." The discussion was opened by Drs. Miner and Jickling.

A paper on "Tuberculosis of the Female Genitalia" was read by Dr. F. E. Reeder. The discussion was opened by Dr. Manwaring.

On January 6th the first January meeting was held.

Dr. A. P. Ohlmacher of Detroit was present and read a paper on "Vaccine Therapy in the Light of the Recent Developments."

Following this paper Dr. W. M. Clift read a paper on "Food Disturbances in Infancy."

The regular quarterly meeting was held January 27th, 1914.

Following the business meeting Dr. Randall of Flint read a paper entitled "Diagnosis of Diseases of the Stomach." Discussed by Dr. Chapel.

Dr. Klingmann of Ann Arbor then read a paper entitled "Syphilis of the Nervous System." The discussion was opened by Dr. Manwaring.

The Genesee County Medical Society are now publishing a bulletin, which contains the programs of the coming meetings a report of the papers that are read at the meetings, and any action that may be taken by the society. The Secretary will be glad to exchange Bulletins with any other County Society.

R. D. SCOTT, SECRETARY.

#### KALAMAZOO ACADEMY

Tuesday, February 10, 1914, 1:30 p. m.

1. Experiences in Surgery of the Nervous System (Illustrated with Lantern Slides). Dr. Max Ballin, Detroit, Mich.

Discussion—Dr. O. H. Clark, Dr. C. E. Boys, Dr. R. E. Balch.

2. Roentgen Rays in Diagnosis (Illustrated with Lantern Slides.) Dr. I. H. Levy, Syracuse, N. Y.

Discussion—Dr. A. W. Crane, Dr. A. L. Robinson, Dr. H. O. Statler, Dr. P. T. Butler.

Tuesday, February 10, 1914, 1:30 p. m.

1. The Roentgen Evidences of Intestinal Stasis, with Special Reference to Ileal Stasis. Dr. J. T. Case, Battle Creek, Mich.

2. The Roentgen Examination of the Head. Dr. P. M. Hickey, Detroit.

The papers of Dr. Case and Dr. Hickey were discussed by Drs. Henry Hulst of Grand Rapids, A. W. Crane, L. H. Stewart, A. S. Youngs, O. H. Clark and A. H. Rockwell.

Minutes of the last meeting of the Academy, January 27, 1914.

Dr. J. E. Maxwell being absent the first Vice-President, Dr. E. R. Swift, acted as chairman. Minutes of the annual meeting were read and approved. Dr. A. H. Rockwell wished inserted in motion for seventy-five dollars to be diverted to Library fund, the following: "If funds in treasury permitted." Dr. A. W. Stone presented the applications of the following for associate membership: W. A. Royer, Mendon; F. A. Pratt, Centerville; David M. Kane, Fred. W. Robinson, Sturgis.

For full membership: Grant Ide, Mattawan; Edward O. Hanlon, Wayland; John R. Giffin, Bangor; D. W. Crankshaw, Lawrence; Harlon S. Smith, Schoolcraft; John T. Chapin, Schoolcraft; Edward Murray Auer, Kalamazoo; Rob. R. Lawrence, Hartford; James Edward Bryan, Wayland; Olin H. Stuck, Otsego; Howard E. Whitney, Otsego; Leander T. Van Horn, Otsego; Edwin G. Low, Bangor. J. C. Maxwell moved that J. T. Upjohn be elected to membership in the Academy. Carried.

Report of Dr. A. H. Rockwell.

The meeting of the Council of the Michigan State

Medical Society was held in Detroit, January 21, 1914. Dr. A. H. Rockwell represented the fourth district. He reported that the STATE JOURNAL gave a very good financial report. As a Medical Periodical we all know the good reputation that it is building up for itself. Dr. W. T. Doge and Dr. A. W. Hume are members of the Council as well as of the Medical Registration Board. They are very willing to support the medical societies in the prosecution of itinerant quacks who appear and disappear with remarkable rapidity. United action by local and state organizations is indispensable for the suppression of these medical criminals.

### KENT COUNTY

A special Clinic and meeting was held by the Kent County Medical Society on Feb. 4th, with Dr. F. H. Albee the invited guest.

The clinic was held at the U. B. A. Hospital where about twenty cases were demonstrated, four of which were operated upon.

The operations were as follows:

Case 1—Pt. or Dr. R. Apted. Sections of spinous processes of 10-11-12 Dorsal and 1st Lumbar Vertebrae with transplantation of bone from tibia for Pott's Disease. Albee Operation.

Case 2.—Pt. of Dr. DeVries. Splicing of scaphoid and bone graft from tibia, and tenotomy, for talipes equina varus.

Case 3—Pt. of Dr. Tibbitts. Resection of sarcoma involving upper one-third of tibia, and transplantation of longitudinal section from sound tibia to fill in the space between ends of sectional tibia.

Case 4—Pt. of Dr. Irwin. Open tenotomy of spastic paralysis resulting in talipes equino. Union of ends of severed tendon with heavy kangaroo tendon.

On account of the lateness of the hour it was impossible to carry out the entire program. Among the cases presented for operation were the following:

- I Pott's Disease. Dr. Vandenberg.
- I Spinal Paralysis. Dr. Rooks.
- I Volkman's Contracture. Dr. McBride.
- I Ununited fracture of jaw. Dr. Fabian.
- I Paraplegia. Dr. John Wenger.
- I Infantile Paralysis-Equino Varus. Dr. Fabian.
- I Infantile Paralysis. Dr. A. M. Campbell.
- I Hip joint, Tubercular. Dr. A. M. Campbell.
- I Infantile Paralysis, Equino Varus. Dr. Montgomery.
- I Scoliosis. Dr. Irwin.
- I Hypopituitarism. Dr. V. M. Moore.

About 70 visitors were present at the clinic. Among those from out of the city were the following: Dr. H. Randall, Flint; Dr. F. H. Shorts, Kent City; Dr. J. T. Cramer, Muskegon; Dr. J. Drummond, Casnovia; Dr. R. M. J. Hotvedt, Muskegon; Dr. J. T. McGuffin, Hastings; Dr. J. F. Pinkham, Belding; Dr. J. D. Whelpley, Howard City; Dr. C. H. Anderson, Lowell.

Following the clinic, the visitors were invited to a luncheon given at the Association of Commerce rooms in honor of Dr. Albee at which time he read a paper "Original Surgical Uses of the Bone Graft. A Report of 225 Cases." The paper was extensively illustrated by means of lantern slides.

The regular meeting of the Kent County Medical Society was held on Feb. 11 at the Association of Commerce rooms. Dr. A. M. Campbell presiding.

The following names having been submitted to the Board of Directors for membership, were favorably reported, and duly elected members of the society.

- Dr. A. C. Butterfield.
- Dr. G. J. Stuart.
- Dr. E. B. Strong.

Dr. J. E. Bolander.

Dr. E. S. Sevensma.

On motion of Dr. Spencer, supported by Dr. Warnshuis, the Society considered favorably the proposal that the Society become a member of the Association of Commerce and that the President and Secretary represent it.

Dr. O. E. Herrick was made an Honorary member of the Kent County Medical Society and his name proposed for Honorary membership to the Michigan State Medical Society.

The paper of the evening was given by Dr. B. R. Corbus, his subject being "Gastro-Enterology and Some of Its Problems."

The paper was freely discussed by Dr. H. J. Vandenberg, Dr. C. H. Johnston, and Dr. F. C. Warnshuis. Dr. Vandenberg presented case of metastatic carcinoma involving the liver. Adjourned.

J. J. FABIAN, SECRETARY.

### MUSKEGON COUNTY

On December 5th, 1913, the Muskegon County Medical Society held a very successful meeting at Hackley Hospital, Muskegon. Dr. Daniel LaFerte of Detroit attended the meeting and gave a very interesting talk on "Joint Affections," twelve orthopedic cases being demonstrated. The meeting was a most successful one, and the Society feels grateful to Dr. LaFerte for his kindness in coming such a distance and giving up so much of his valuable time. There was an attendance of twenty-five, several outside members being present.

As no business was transacted at the December meeting the annual meeting was held January 2, 1914, sixteen members being present. The election of officers was as follows:

- President—Dr. Jacob Oosting, Muskegon.
- Vice President—Dr. Geo. F. Lamb, Pentwater.
- Secretary—Dr. J. T. Cramer, Muskegon.
- Treasurer—Dr. L. N. Eames, Muskegon.
- Delegate—Dr. V. A. Chapman, Muskegon.
- Alternate—Dr. F. B. Marshall, Muskegon.
- Director—(3 yrs) Dr. I. M. J. Hotvedt, Muskegon.
- Medico-Legal—Dr. P. A. Quick, Muskegon.

At a meeting held January 30, 1914, a paper was read by Dr. R. C. Stone of Battle Creek on "Diagnosis and Surgery of Gastric Ulcer." The medical treatment was discussed by Dr. J. J. Toles of Battle Creek. Dr. F. B. Marshall of Muskegon read a paper on "Duodenal Ulcers." This proved to be a very interesting meeting, and there was a good attendance.

J. T. CRAMER, SECRETARY.

### SAGINAW COUNTY

The regular monthly meeting of the Saginaw County Medical Society was held at the City Hall Jan. 26th, 1914, with about thirty in attendance.

A paper on "Nephritis" was given by Dr. J. H. Powers of Saginaw, and a paper on "Treatment of Some Common Cardiac Irregularities" by Dr. Hugo A. Freund of Detroit. Dr. Freund also demonstrated a patient with aneurism. Mr. W. T. Singer, of Chicago, representing the American Medical Association, gave an interesting paper on the work of the Association.

Dr. A. L. Seeley of Mayville was present and talked on the work of the State Society. Several new members were elected.

A. R. MCKINNEY, SECRETARY.

### SANILAC COUNTY

The thirteenth Annual Meeting of the Sanilac County Medical Society was held at the Court House, Sandusky, Mich. on Monday, the 26th of January, 1914, for the purpose of electing

officers for 1914 and other business. The following officers were elected.

President—C. G. Robertson, Sandusky.

Vice President—E. Y. Partello, Applegate.

Secretary-Treasurer—J. W. Scott, Sandusky.

Delegate—Geo. S. Tweedie, Sandusky.

Alternate—J. W. Scott, Sandusky.

Medico Legal Com.—D. D. McNaughton, Argyle.

J. W. SCOTT, SECRETARY.

### SOUTHWESTERN MICHIGAN TRIOLOGICAL ASSOCIATION

Fourth stated meeting Feb. 2, 1914, Dr. E. J. Bernstein, President in the Chair.

The fourth regular meeting of the Southwestern Michigan Triological Association was held in Grand Rapids, February 2nd; Dr. E. J. Bernstein of Kalamazoo, the president in the chair. Dr. P. T. Urquhart, Grand Rapids, presented five cases of injury to the eye, giving history of cases and presenting the patients for examination.

Dr. Ferris N. Smith of Grand Rapids read a paper on "Lues of the Ear and its Treatment," which on account of its great value and because of the dearth of literature on this subject, we are abstracting at length:

"The experiments resulting in the production of Arsecetin and Salvarsan, the data accumulated in the use of these drugs and coincident development of a new technic in examining the labyrinth have entirely revolutionized our diagnosis and treatment of lues of the internal ear.

The common lesion of the middle ear occurs during the secondary stage and usually manifests itself as a catarrhal or suppurative otitis and may be dependent solely upon tubal obstruction and secondary infection with no local specific etiology.

The frequency of syphilis as an etiological factor in lesions of the nerve of hearing from its origin to its internal filaments in the cochlea and labyrinth demand our most careful attention. Obviously, primary lesions do not occur in this region. The disease may be part of a general condition or it may involve the internal ear alone. However, it generally manifests itself during the late secondary stage of early tertiary stage. Again, ear lesions may be the only manifestations of the return of former symptoms in a treated case. The symptoms chiefly those of any internal ear involvement with certain prodromes and sequelae which characterize the condition. No symptom is pathognomonic.

Those symptoms which arouse our suspicion and build our diagnosis are periodic, sudden, sharp pains in an objectively negative ear with paresthesias of the auricle and canal; dull deep bone pains which are worse toward midnight; redness and tenderness over the mastoid with a normal ear; staggering; transitory asphasias, reduced bone conduction with a negative fork test; reduced reaction of the labyrinthine nerve; and unreacting labyrinth; destruction of the cochlear or labyrinthine nerve alone; marked differences between spoken and whispered voice; a facial paralysis with a destroyed cochlear nerve; and an apparently idiopathic palsy. Sudden deafness in children without injury is due to congenital lues and sudden deafness in young adults is almost always certain to be specific. If a patient comes complaining of periodic sudden sharp pains in a negative ear which go quickly and he has paresthesia of the external ear, it is only necessary to differentiate Arteriosclerosis to diagnose an approaching Tabes or General Paresis. Bone pains and tenderness over the mastoid with a negative ear which are more marked in the evening are strongly suspicious but must be differentiated from a mastoid due to encapsulated organisms such as Friedlander's *Diplococcus Pneumoniae*, *Streptomucoccus*, Schattmuller's bacillus and the Meningococcus, from beginning erysipelas and rheumatism. Oscar Beek claims that 85% of all cases of reduced bone conduction with the normal hearing are specific. This sign appears with the general symptoms and always persists. Certain cases in which the patient has a side to side stagger, a spontaneous horizontal nystagmus stronger to one side than the other and a negative labyrinth are specific of the central type and often simulate tumors of the posterior fossa.

In cases where the labyrinth reacts slowly and the reaction is shortened in time after turning or irrigation, we are dealing with sclerosis of the nerve which may be specific, and where there is no reaction to turning, caloric or electrical irritation we are dealing with a nuclear lesion which is not infrequently specific. A facial paralysis with a destroyed cochlear nerve speaks for a lesion in the cerebello-pontile angle and this is a predilection spot for gummatas.

If the patient has had no acute fever or drug nor engages in any occupation causing deafness and yet appears with an isolated lesion of the cochlear or labyrinthine nerve on one side or the other, syphilis may be diagnosed. Marked

differences in the hearing of spoken and whispered voice speaks strongly for syphilis.

One does not always find a positive Wasserman test in cases of labyrinthine syphilis. This is probably due to the fact that the ear organ is very sensitive and easily affected by a change not sufficiently great to change a negative to a positive Wasserman. Puncture gives much evidence but is dangerous in these cases because of the blood vessel conditions which lead to rupture or to edema following the release of pressure.

If we irrigate both labyrinths of a syphilitic at the same time, there is no reaction. Likewise there is no difference noted upon turning but the galvanic test does show nerve differences. Hence the trouble is in the nerve. Therefore, patients with spontaneous horizontal nystagmus and no difference in the labyrinth have lesions in the posterior fossa while those with spontaneous rotary nystagmus and electrical differences have nerve lesions. A differential diagnosis must be made from hemorrhage, lesions from drugs and fevers, arterio-sclerosis, oto-sclerosis, Meniere's, brain tumor, so called idiopathic mastoids, early erysipelas, rheumatism and shortened bone connection occurring in other conditions.

The prognosis in cases of inherited lues is very unfavorable as to ear lesions. These are probably never influenced by specific treatment but remissions may occur either coincident with or without it. Hearing defects, especially those due to minor ear lesions, last much longer than the general evidence of the disease. Recently acquired syphilis has a favorable prognosis as to hearing, station and noises under proper treatment but old untreated cases in debilitated subjects progress in spite of any treatment. The outlook in meta-luetic cases, such as Tabes and General Paresis, is very poor because nerve degeneration is already started. In secondary cases the outlook is very favorable under proper treatment.

The choice of a proper treatment of syphilis with ear involvement is only second in importance to diagnosis. We must choose a treatment which will be effective against the disease, at the same time not so strongly active as to permanently damage the cranial nerves which run in bony canals. We have a choice of mercury in the form of (1) inunctions; (2) insoluble preparations; (3) soluble preparations; (4) and Salvarsan. The first never produces any local reaction; the second occasionally does; the third frequently does when used in big doses; and 606 very frequently produces marked reaction, the effects of which appear as deafness, disturbed equilibrium and facial palsy.

Let us first consider congenital lues. This condition is not altered by mercury nor 606. Spontaneous remissions may coincide with the treatment but do not result from it. A better procedure is the use of pilocarpine. This will give relief for one or two months at a time in young patients.

We must constantly bear in mind that "606" has a toxic selection for the vestibular nerve and that only five cases of vestibular destruction were in the literature before its use whereas they are now reported by the dozens.

In the discussion Dr. Roller Grand Rapids reported numerous cases of sudden deafness in children suffering from Interstitial Keratitis. The deafness in these children did not clear up with the improvement of the eye conditions. Dr. Bernstein of Kalamazoo reported a case of administration of Salvarsan with the production of deafness and commented upon the fact that the literature has urged an examination of the eyes before the administration of Salvarsan but has said very little about previous examination of the ears. Dr. Urquhart, Grand Rapids, has never seen any ill results in the eyes from the use of Salvarsan in over one hundred cases examined after administration. Dr. Welsh of Grand Rapids reported two cases of total deafness following the use of Salvarsan, one of which cleared up to quite an extent after repeated injections. He cited Beek's suggestion to give repeated injections if deafness has followed the first injection, and states that after the third injection the hearing is frequently restored. Dr. Smith in closing urged that since Salvarsan has a special predilection to vestibular destruction the function of the vestibule should be determined before injection and if there is much reduction of function, Salvarsan be either not given or given in small repeated doses.

Dr. Smith also reported a case of repeated spontaneous nasal hemorrhage occurring both before and eight days after turbinectomy in a case of Basedow's disease. He succeeded finally in seeing the patient during one of these hemorrhages which was simply a very free oozing of blood. The coagulation time was fifteen minutes. After a few administrations of calcium chloride the coagulation time



was reduced to seven minutes since which time there has been no hemorrhage.

The five cases of concussion of the eye reported by Dr. Urquhart with the presentation of the patient are briefly outlined:

Case I. Man struck in eye by a block of wood January 22, 1914. Since then he has great pain in the eye with blurred vision. The eye became decidedly worse January 24. Conjunctiva red; pupil dilated with atropine; media clear; serious retinitis; retina hazy and edematous. Vision 20/40+. This is a case of nonmotile retinae which will undoubtedly clear up in a few days or weeks.

Case II. Man hurt January 23, struck in eye by block of wood, no pain for one hour, after which the eye became very painful. In this case there is no evidence of retinitis, but there is a detachment of a piece of uveal tissue which has become attached to the lens and is seen as a dark pigment piece the shape of a broom. There are also striations of opacity in the lens arranged around the equator and radiating from the center like spokes of a wheel. The vision is not impaired.

Case III. Right eye struck by piece of wire four inches long November 15, 1913. The eye was very sore for three or four days. First seen by Dr. Urquhart December 13, when he presented a clear case of serious retinitis. The outlines of the disc were hazy and indistinct and there were several punctate hemorrhage spots in retina. He says he cannot see at all, but on reading tests, shows vision of 20/100, but says everything is extremely hazy. On January 31, I found the serious retinitis to be much improved. The vessels clearly cut, and disc distinct. However there are several good sized white spots in the fundus which appear to be at the exact location where before had existed the hemorrhages. There are two large and distinct spots in Macula. There have been retinal and choroidal degeneration at these spots, and I believe his great loss of central vision due to thinning and atrophy of macular bundle.

Case IV. This man was struck in eye by block of wood about December 1st. The media was clear, but there was seen a large flame shaped hemorrhage in retina and completely covering the macula. We now see a degenerated retina and choroid at this point looking like a macular hole. In addition to this interesting point we find a beautiful Retinitis Circinata completely encircling the macula and showing the characteristic passover bread appearance. In this case the man asserts he saw perfectly well before the accident. There was undoubtedly a first hemorrhage at this time. An eye with Retinitis Circinata is liable to hemorrhage at any time, but in this I feel sure that the hemorrhage was due to atrophy following upon hemorrhage.

Case V. Struck in eye by flying emery wheel. Incised wound in cornea back of pupillary margin. Iris attached to angle of wound. This occurred January 1913. I have not seen him before yesterday. There is a line of fracture in the capsule of the lens which shows as a whitish elliptical ring. It looks almost like a dislocation. The lens is completely filled with opaque bodies. The ciliary body was torn, and a long ciliary tag runs to lens and is attached thereto. The fundus can not be seen. Vision completely lost. Text books say very little about concussion of the eye. It is a common accident, and one which leaves no external signs. The eye may become reddened and even painful for a short time, but severe retinal injury and shock as well as actual hemorrhage and tearing may exist without external evidences of the grave nature of the lesion. These five cases are all of concussion of the eye. In but one was there any external evidence of injury, and in this case the tear in the cornea probably had little to do with the shock to the eye.

In the discussion Dr. Roller emphasized the necessity of extreme care in the examinations of all injured eyes and especially urged that we be on the lookout for malingers especially in view of the employers liability act. Dr. Rogers saw Case III soon after the injury when the "degenerative points" had about the same appearance that they do now, and he believes there had not been sufficient time since the accident for all the degeneration to take place. Dr. Welsh cautioned extreme conservatism in stating how such loss of function was due to any past injury, as we do not know the condition of the eye before the injury. Dr. Chapman believes the round spots or holes in Case III could not be the result of tears either by contra-coup or by any other force as the edges are too perfectly smooth and the holes too round. He suggested that in view of our employers liability act, employers are very careful about the efficiency of their machines, factories etc., but are careless about the efficiency of their men. He believes all employers of men wherever there is any liability to accident involving the special senses, should know the physical condition of their men relative to the organs of special

senses, as a condition of employment. Dr. Haughey believed the holes or spots in the retina and choroid of Case III, were probably present before the accident and with Dr. Chapman could not see why this man should not have better vision. The two spots in the macular region are small and do not necessarily interfere with central vision.

The next meeting will be held in Kalamazoo, March 2nd.

WILFRID HAUGHEY, SECRETARY.

#### MEMBERS

Kalamazoo—Edward J. Bernstein, E. P. Wilbur, F. E. Grant.

Battle Creek—Raymond D. Sleight, Wm. M. Carling, Penton N. Colver, Wilfrid Haughey, H. M. Dunlap.

Jackson—G. E. Winter, A. E. Bulson, G. A. Bulson, H. D. Obert, Flemming Carrow.

Grand Rapids—John R. Rogers, D. Emmet Welsh, Louis A. Roller, E. W. E. Patterson, R. T. Urquhart, Ferris N. Smith, J. W. Shank.

Flint—W. G. Bird.

Muskegon—V. A. Chapman, W. P. Gamber, A. F. Harrington.

February 2, 1914.

#### ST. JOSEPH COUNTY

The St. Joseph County Medical Society met in the East room of the library at Sturgis Jan. 22, 1914, at 1 P. M., the annual meeting.

In the absence of Dr. R. E. Dean, President, and Dr. W. C. Cameron, Vice President, Dr. J. H. Moe was asked to preside.

Dr. A. A. Wade read a carefully prepared paper on "Ulceration of the Stomach," one full of interest and instructions. The paper was discussed by those present. Dr. Fulkerson reported a case of interest along the same line.

The election of officers resulted as follows:

President—R. E. Dean, Three Rivers.

Vice President—W. C. Cameron, White Pigeon.

Secretary-Treasurer—S. R. Robinson, Sturgis.

Delegate—J. H. Moe, Sturgis.

Alternate—D. V. Runyan, Sturgis.

Medico Legal—F. W. Robinson, Sturgis.

Censors—M. Saben, Centerville; W. A. Royer, Mendon; D. V. Runyan, Sturgis.

Doctors D. K. Anderson, G. L. Bliss and G. E. Barninger were elected to membership.

Dr. Fulkerson was very enthusiastic over the possibilities of the Academy of Medicine and what it offers its members. S. R. ROBINSON, SECRETARY.

#### WAYNE COUNTY

##### PROGRAM

Monday, Jan. 26—Historical evening. Vesalius: Fourth Centenary. Dr. W. J. Stapleton, Jr.

Galen and His Times. Dr. Carl McLelland.

A Plea for the Study of Medical History. Dr. J. H. Dempster.

Monday, Feb. 2—General Meeting, "Original Uses of the Bone Graft. A report of 225 Cases." Illustrated by the Lantern. Fred H. Albee, New York City.

Monday, Feb. 9—Dedication Night.

Monday, Feb. 9—House Warming.

Vaudeville—Smoker, etc.

Monday, Feb. 16—General Meeting.

Some studies on—

a. The relation of oral to systemic infection.

b. Tri-calcic salt nutrition.

c. The relation of the bones of the face to the functioning of the brain.

d. The mechanical recording of clinical data.

Weston A. Price, Cleveland, O.

Monday, Feb. 23—Surgical Section.

Practical points (of special interest to the general practitioner) in the treatment of diseases of the ear. Dr. J. M. Ingersoll, Cleveland, O.

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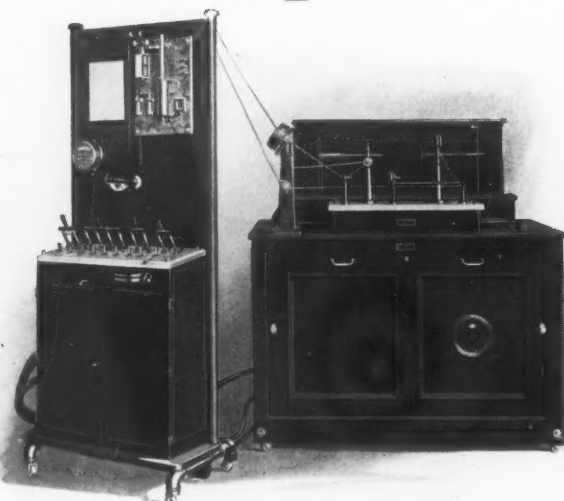
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